The Examination of Protective Factors between Corporal Punishment and Adolescent Aggression

By Aimee Elizabeth Neaverson

Wolfson College

University of Cambridge

April 2018

Supervised by Professor Manuel Eisner and Dr Aja Murray

This dissertation is submitted for the degree of Doctor of Philosophy at the University of Cambridge

Title: The Examination of Protective Factors between Corporal Punishment and Adolescent Aggression

By Aimee Elizabeth Neaverson

Abstract

Objectives The development of aggression from childhood to adulthood is well-researched, and extant work has identified a large number of developmental risk factors within the individual, family, and social domains. Among them, poor parenting, including harsh practices like corporal punishment, have repeatedly been found to predict adolescent behavioural problems, that may then negatively affect adult behaviours such as violence and offending. An area of research that is becoming increasingly important is one that seeks to identify the reasons why some people do not become aggressive, even when they have been exposed to well established risk factors. What is it that has protected them from becoming aggressive later in life? The current study examined whether self-control and having a positive teacher-child relationship acted as protective factors between corporal punishment and adolescent aggression.

Methods An autoregressive cross-lagged panel model was used to examine self-control and teacher-child relationships as both direct and interactive protective factors between corporal punishment and adolescent aggression. Teacher and self-reported data was used from three waves (waves 4-6) of the Zurich Project on the Social Development of Children and Youths (Z-proso), a prospective longitudinal study of adolescents in Switzerland.

Results The results show that both self-control and having a positive teacher-child relationship were direct protective factors against concurrent aggression. However, the interactive protective effect of these factors differed depending on the stage of adolescence and level of exposure to risk. Furthermore, differences were found when considering males and females separately.

Declaration

This thesis is the result of my own work although it uses data from the Zurich Project on the Social Development of Children and Youths (z-proso).

This thesis is not substantially the same as any that I have submitted, or, is being concurrently submitted for a degree or diploma or other qualification at the University of Cambridge or any other University or similar institution. I further state that no substantial part of my dissertation has already been submitted, or, is being concurrently submitted for any such degree, diploma or other qualification at the University of Cambridge or any other University or similar institution.

This thesis does not exceed the word limit.

Signed: _____

Dated: _____

Acknowledgements

When I secretly applied to Cambridge, 6 years ago, I never thought that my dreams of completing a PhD at the University of Cambridge would become reality. Five years later, I reflect on what has been an extremely challenging yet rewarding experience. While being enrolled on this part-time PhD, I have also been working full-time and raising my daughter who was born a few weeks after my first-year review. This process has not only taught me various academic and life skills, but it has allowed me to demonstrate to others what you can accomplish if you want something bad enough. However, all of this would not have been possible if it were not for Professor Eisner and his willingness to take me on as a PhD student. For that, I am eternally grateful. I also owe extreme gratitude to the Wakefield Scholarship Committee who made it financially possible for me to attend the University of Cambridge.

I am very thankful to many people for their help and support throughout this process. First and foremost, thank you to my supervisors, Professor Eisner and Dr Murray. I am so fortunate to have been able to work with you and learn from you throughout this process. Your patience, guidance and generosity over the past 5 years has been invaluable. I am also grateful for all the hard work by Denis Ribeaud. Your work on the datasets, keeping the study together, providing everyone with information and responding quickly to queries is irreplaceable. Thank you to all of the children, parents and teachers who provided data for the z-proso study, as well as the research assistants involved in collecting data. I would also like to acknowledge gratitude for funding from the Jacobs Foundation (Grant 2010-888) and the Swiss National Science Foundation (Grants 100013_116829 & 100014_132124).

I have to give thanks to my friends, family and colleagues who have tolerated me throughout this process, listened to me while I tried to talk through statistical challenges and offered their time as my proof readers. I would especially like to thank Mom, Steve and Sharon Khan for all of their time and support throughout this process.

Finally, thank you to my husband, Tom. You have been my rock and my biggest supporter since my Undergraduate degree. I could not have accomplished this much without your constant belief in me and encouragement. To my daughter, Brooke, thank you for making me smile even on the hard days and for giving me a reason to stop and play. I must also acknowledge ‘BabyNev2’, who, at the time of my viva, was due to arrive in three weeks. Thank you for motivating me to get everything finished before you arrive so that we can have lots of PhD-free fun together.

This work is dedicated to all of those who were told “you can’t”.

You can.

Contents

Abstract ..... **ii**
Declaration ..... **iv**
Acknowledgements ..... **vi**
Contents ..... **x**
List of Tables ..... **xiv**
List of Figures ..... **xvi**
Chapter 1: Introduction and Overview of the Current Study **1**
Chapter 2: Corporal Punishment and Aggression **5**
Corporal Punishment Increases Aggression 7
Causal Mechanisms 7
Emotional Regulation, Social and Cognitive Skills 8
Social Information Processing 10
Increased Levels of Strain and Frustration 13
Empirical Studies of the Association between Corporal Punishment and Aggression 16
Gender differences in the Effects of Corporal Punishment 18
Parents who decide to use Corporal Punishment 20
Support for the use of Corporal Punishment 25
Conclusion 26
Chapter 3: Resilience and Protective Factors **29**
Introduction 29
Resilience 29
Protective Factors 30
Definitions of Protective Factors 31
Domains of Protective Factors 32
The Difference between Protective Factors and Resilience 35
Theoretical Considerations 36
Empirical Recommendations: Examining Protective Factors 38
Empirical Studies Examining Protective Factors 41
Corporal Punishment and Protective Factors 47
Chapter 4: Methods **51**
Sample 51
Ethics 52
Measures 52
The Corporal Punishment Scale 53
The Self-Reported Aggression Scale 53

The Combined Teacher-Child Aggression Scale 54
Gender and Socioeconomic Status.....54
Conclusion.....54
Chapter 5: Baseline Analysis - Corporal Punishment and Adolescent Aggression 57
Introduction.....57
Data Analysis.....58
Intergenerational Transmission of Corporal Punishment Measures 59
The Analytic Plan.....59
Descriptive and Inferential Statistics 60
Hierarchical Regression.....60
Autoregressive Cross-lagged Panel Model 61
Baseline Model Results 63
Sample 63
Intergenerational Transmission of Corporal Punishment: Results.....63
Examining Main Effects between Corporal Punishment and Adolescent Aggression.....66
Discussion of Baseline Analyses 91
Conclusion.....96
Chapter 6: Self-control as an Interactive Protective Factor 99
Introduction.....99
Self-control as a Protective Factor 99
The Current Study 102
Methods.....102
The Self-control Scale 103
The Analytic Plan.....103
Descriptive and Inferential Statistics 104
Hierarchical Regression.....104
Autoregressive Cross-lagged Panel Model 105
Results: Low Self-control 106
Descriptive Statistics: Low Self-Control 106
Correlations: Self-Control 107
Regressions: Self-Control.....110
Autoregressive Cross-Lagged Panel Model Results: Self-control 119
Discussions and Conclusions 132
Chapter 7: Positive Teacher-child Relationship as an Interactive Protective Factor 135
Introduction.....135
Positive Teacher-child Relationship as an Interactive Protective Factor.....135

The Current Study 137
Methods....138
Positive Teacher-Child Relationships Scale....138
The Analytic Plan....139
Hierarchical Regression....139
Autoregressive Cross-lagged Panel Model....140
Results: Positive Teacher-child Relationships....141
Descriptive Statistics: Positive Teacher-child Relationships....141
Correlations: Teacher-child Relationships....142
Regressions: Teacher-child Relationship....145
Autoregressive Cross-Lagged Results: Positive Teacher-child Relationships....150
Discussions and Conclusions 165
Chapter 8: Summary of Findings and Final Conclusions 169
Introduction....169
Summary of Main Findings 169
Discussion of Main Findings 173
Final Conclusions 178
Strengths and Limitations 181
References 185

List of Tables

Table 1 Sample Age and Gender 63
Table 2 Parent-Reported Corporal Punishment (Exposure and Administration) 64
Table 3 Parent-Reported Experience and Administration of Corporal Punishment 64
Table 4 Parent-Reported Experience and Administration of Corporal Punishment Crosstabulation 64
Table 5 Correlations Examining Parental Exposure to Corporal Punishment and Parental self-reported Administration of Corporal Punishment 65
Table 6 Hierarchical Regression Analysis for Parental Exposure to Corporal Punishment Predicting Administering Corporal Punishment at Age 10. 66
Table 7 Corporal Punishment Descriptive Statistics 67
Table 8 Experience of Corporal Punishment by Age and Gender 67
Table 9 Self-Reported Aggression Descriptive Statistics 68
Table 10 Correlations Between Corporal Punishment and Self-Reported Aggression 70
Table 11 Hierarchical Regression Analysis for Age 11 Corporal Punishment Predicting Self-Reported Aggression at Age 11, 13 and 15, with 95% CI Reported in Parentheses. 73
Table 12 Hierarchical Regression Analysis for Age 11 Corporal Punishment Predicting Teacher-Child Reported Aggression at Age 11, 13 and 15, with 95% CI Reported in Parentheses. 74
Table 13 Hierarchical Regression Analysis for Age 13 Corporal Punishment Predicting Self-Reported Aggression at Age 13 and 15, with 95% CI Reported in Parentheses. 75
Table 14 Hierarchical Regression Analysis for Age 13 Corporal Punishment Predicting Teacher-Child Aggression at Age 13 and 15, with 95% CI Reported in Parentheses. 76
Table 15 Hierarchical Regression Analysis for Age 15 Corporal Punishment Predicting Self-Reported Aggression at Age 15, with 95% CI Reported in Parentheses. 77
Table 16 Hierarchical Regression Analysis for Age 15 Corporal Punishment Predicting Teacher-Child Reported Aggression at Age 15, with 95% CI Reported in Parentheses. 78
Table 17 Hierarchical Regression Analysis for Age 11 Self-Reported Aggression Predicting Corporal Punishment at Age 11, 13 and 15, with 95% CI Reported in Parentheses. 81
Table 18 Hierarchical Regression Analysis for Age 11 Teacher-Child Reported Aggression Predicting Corporal Punishment at Age 11, 13 and 15, With 95% CI Reported in Parentheses. 82
Table 19 Hierarchical Regression Analysis for Age 13 Self-Reported Aggression Predicting Corporal Punishment at Age 13 and 15, With 95% CI Reported in Parentheses. 83
Table 20 Hierarchical Regression Analysis for Age 13 Teacher-Child Reported Aggression Predicting Corporal Punishment at Age 13 and 15, with 95% CI Reported in Parentheses. 84
Table 21 Hierarchical Regression Analysis for Age 15 Self-Reported Aggression Predicting Corporal Punishment at Age 15, with 95% CI Reported in Parentheses. 85
Table 22 Hierarchical Regression Analysis for Age 15 Teacher-Child Reported Aggression Predicting Corporal Punishment at Age 15, with 95% CI Reported in Parentheses. 86
Table 23 Low Self-Control Descriptive Statistics 107
Table 24 Correlations with Self-Control, Aggression and Corporal Punishment 109
Table 25 Hierarchical Regression Analysis for Age 11 Self-Control Predicting Self-Reported Aggression at Age 11, 13 and 15, with 95% CI Reported in Parentheses. 113
Table 26 Hierarchical Regression Analysis for Age 11 Self-Control Predicting Teacher-Child Reported Aggression at Age 11, 13 And 15, with 95% CI Reported in Parentheses. 114
Table 27 Hierarchical Regression Analysis for Age 13 Self-Control Predicting Self-Reported Aggression at Age 13 and 15, with 95% CI Reported in Parentheses. 115
Table 28 Hierarchical Regression Analysis for Age 13 Self-Control Predicting Teacher-Child Aggression at Age 13 and 15, with 95% CI Reported in Parentheses. 116

Table 29 Hierarchical Regression Analysis for Age 15 Self-Control Predicting Self-Reported Aggression at Age 15, with 95% CI Reported in Parentheses. 117
Table 30 Hierarchical Regression Analysis for Age 15 Self-Control Predicting Teacher-Child Reported Aggression at Age 15, with 95% CI Reported in Parentheses....118
Table 31: Path Results of Autoregressive CLPM Testing Self-Control as an Interactive Protective Factor....121
Table 32 Path Results for MALES of Autoregressive CLPM Testing Self-Control as an Interactive Protective Factor....126
Table 33 Path Results for FEMALES of Autoregressive CLPM Testing Self-Control as an Interactive Protective Factor....130
Table 34 Teacher-Child Relationships Descriptive Statistics....142
Table 35 Correlations with Positive Teacher-child Relationships, Aggression and Corporal Punishment....144
Table 36 Hierarchical Regression Analysis for Age 11 Teacher-Child Relationships Predicting Self-Reported Aggression at Age 11, 13 and 15, with 95% CI Reported in Parentheses.....148
Table 37 Hierarchical Regression Analysis for Age 13 Teacher-Child Relationship Predicting Self-Reported Aggression at Age 13 and 15, with 95% CI Reported in Parentheses. 149
Table 38 Hierarchical Regression Analysis for Age 15 Teacher-Child Relationship Predicting Self-Reported Aggression at Age 15, with 95% CI Reported in Parentheses. 150
Table 39 Path Results of Autoregressive CLPM Testing Teacher-Child Relationship as an Interactive Protective Factor....154
Table 40 Path Results for MALES of Autoregressive CLPM Testing Positive Teacher-Child Relationships as an Interactive Protective Factor....159
Table 41 Path Results for FEMALES of Autoregressive CLPM Testing Positive Teacher-Child Relationships as an Interactive Protective Factor....163
Table 42: Summary of Main Moderation Results....172

List of Figures

Figure 1: Cycle of Corporal Punishment and SIP Theory 22
Figure 2: Disrupted Cycle of Corporal Punishment Using SIP Theory 22
Figure 3 Autoregressive Cross-Lagged Panel Model for Baseline Analysis.....62
Figure 4 Autoregressive Cross-Lagged Panel Model Including Self-Reported Aggression.....88
Figure 5 Autoregressive Cross-Lagged Panel Model with the Combined Teacher-Child Reported Aggression Measure. 89
Figure 6 Results of Autoregressive Cross-lagged Model for Males 90
Figure 7 Results of Autoregressive Cross-Lagged Model for Females 91
Figure 8 Autoregressive Cross-lagged Panel Model Testing for Interactions.....106
Figure 9 Autoregressive Cross-Lagged Panel Model Testing Self-Control as an Interactive Protective Factor Between Corporal Punishment and Aggression.....120
Figure 10 Simple Slopes Showing the Association between Age 11 Corporal Punishment and Age 11 Aggression at High (+1 *SD*) Medium (centred mean) and Low (-1 *SD*) Levels of Low Self-Control for the Full Sample. 121
Figure 11 CLPM for Males when Testing Self-Control as an Interactive Protective Factor 125
Figure 12 Simple Slopes Showing the Association between Age 11 Corporal Punishment and Age 11 Aggression at High (+1 *SD*) Medium (centred mean) and Low (-1 *SD*) Levels of Low Self-Control for MALES. 125
Figure 13 Simple Slopes Showing the Association between Age 15 Corporal Punishment and Age 15 Aggression at High (+1 *SD*) Medium (centred mean) and Low (-1 *SD*) Levels of Low Self-Control for MALES. 126
Figure 14 Autoregressive CLPM for Females when Testing Self-Control as an Interactive Protective Factor 129
Figure 15 Simple Slopes Showing the Association between Age 11 Corporal Punishment and Age 15 Aggression at High (+1 *SD*) Medium (centred mean) and Low (-1 *SD*) Levels of Age 13 Low Self-Control for FEMALES. 130
Figure 16 Autoregressive Cross-lagged Panel Model Testing for Interactions: Teacher-Child Relationships 141
Figure 17 Autoregressive Cross-Lagged Panel Model Testing Positive Teacher-Child Relationships as an Interactive Protective Factor Between Corporal Punishment and Aggression 153
Figure 18 Simple Slopes Showing the Association between Age 11 Corporal Punishment and Age 13 Aggression at High (+1 *SD*) Medium (centred mean) and Low (-1 *SD*) Levels of Positive Teacher-Child Relationship for the Full Sample. 153
Figure 19 Results of CLPM for Males when Testing Positive Teacher-Child Relationships as an Interactive Protective Factor.....158
Figure 20 Simple Slopes Showing the Association between Age 15 Corporal Punishment and Age 15 Aggression at High (+1 *SD*) Medium (centred mean) and Low (-1 *SD*) Levels of Positive Teacher-Child Relationships for MALES. 158
Figure 21 Results of Autoregressive CLPM for Females when Testing Positive Teacher-Child Relationships as an Interactive Protective Factor.....162
Figure 22 Simple Slopes Showing the Association Between Age 11 Corporal Punishment and Age 11 Aggression at High (+1 *SD*) Medium (centred mean) and Low (-1 *SD*) Levels of Positive Teacher-Child Relationship for FEMALES 162

Chapter 1: Introduction and Overview of the Current Study

The development of aggression from childhood to adulthood is well-researched, and extant work has identified a large number of developmental risk factors within the individual, family and social domains (Jolliffe, Farrington, Piquero, Loeber, & Hill, 2017; Loeber, Pardini, Stouthamer-Loeber, & Raine, 2007; Marcus, 2017; Peters, McMahon, & Quinsey, 1992). Amongst them, poor parenting, including harsh practices like corporal punishment, have repeatedly been found to predict adolescent behavioural problems, that may then negatively affect adult behaviours such as violence and offending (Marcus, 2017). This can inevitably have both emotional and financial implications to victims and members of society. An area of research that is becoming increasingly important is one that seeks to identify the reasons why some people do not become aggressive, even when they have been exposed to well-established risk factors. What is it that has protected them from becoming aggressive later in life? In response to the above question, this study examined whether self-control and positive teacher-child relationships acted as interactive protective factors (defined below) between corporal punishment and the development of adolescent aggression.

This study is positioned within the context of resilience research. The concept of resilience comes from the notion that not everyone who is faced with a risk factor has the same negative outcomes. Within resilience research and developmental criminology, there has been an increased focus on identifying the reasons why some individuals do not develop problem behaviour after being exposed to known risk factors. The result of this is the study of protective factors, which has many different definitions and explanations as will be discussed in Chapter 3. The current thesis makes contributions to the study of youth aggression by examining two domains of protective factors using longitudinal data. This research will develop a detailed explanation of the relation between corporal punishment and aggression by exploring 1) the intergenerational transmission of corporal punishment, 2) the relation between corporal punishment and subsequent aggression, 3) the role of pre-existing childhood aggression in predicting subsequent childhood corporal punishment and 4) exploring experiences of corporal punishment and testing potential protective factors such as self-control and positive teacher-child relationships.

There is no complete understanding of why some young people develop aggression later in adolescence after having experienced corporal punishment while others do not. Identifying the

link between corporal punishment and subsequent aggression is therefore a worthy research endeavour as it can not only potentially lead to the development of intervention strategies which minimise the negative outcomes of corporal punishment, but it could also potentially reduce violence and offending later in life which is often the outcome of increased aggression in adolescence. Furthermore, previous research (Muller, Hunter, & Stollak, 1995; Niu, Liu, & Wang, 2018) has also indicated that both experiencing corporal punishment and having higher levels of adolescent aggression can increase the chances of that individual being a facilitator of corporal punishment towards their own children later in life. In addition to being at risk of developing higher levels of adolescent aggression, research has also found a link between those who experienced serious punishment as a child and an increased risk for later victimisation during adolescence (Hosser, Raddatz, & Windzio, 2007; Greenwald, 2002). Thus, being able to identify and better understand the link between childhood corporal punishment and adolescent aggression could help to decrease the risk of later victimization in adolescence as well as the intergenerational transfer of corporal punishment and aggression. With regards to the intergenerational transfer of corporal punishment, one common characteristic that physically punitive parents have is a history of experiencing physical punishment when they were children themselves (Muller et al., 1995). Previous research has found a high concordance between experiencing corporal punishment as a child and administering corporal punishment to their own children (Muller et al., 1995). Other studies found that one third of adults who had received rigorous corporal punishment continued this form of punishment with their own children (Kaufman & Zigler, 1987). A more detailed discussion of the relation between corporal punishment and subsequent aggression is provided below; however, the potential for the intergenerational transmission of corporal punishment and aggression adds to the importance of this study and the objective of disrupting the cycle of aggression.

Highly influential academics in the field of criminology have advanced our understanding of how protective factors operate, within an individual dispositional level as well as an environmental level (e.g Farrington, Ttofi, & Piquero, 2016; Hall, Simon, Mercy, et al., 2012; Lösel & Farrington, 2012; Ttofi, Farrington, Piquero, Lösel, et al., 2016; Ttofi, Bowes, Farrington, & Lösel, 2014). The terminology used to explain protective factors is an area within the literature that has been developed by prominent researchers such as Maria Ttofi (e.g Ttofi, Bowes, et al., 2014; Ttofi, Farrington, & Lösel, 2014; Ttofi, Farrington, Piquero, & DeLisi, 2016), David Farrington (e.g Farrington, 1994; Farrington & Ttofi, 2011; Farrington et al., 2016; Piquero, Carriaga, Diamond, Kazemian, & Farrington, 2012), Friedrich Lösel (e.g Lösel & Bliesener, 1994; Lösel & Farrington,

2012; Ttofi, Farrington, et al., 2014) and Rolf Loeber (e.g Loeber & Farrington, 2012; Loeber, Pardini, Stouthamer-Loeber, & Raine, n.d.; Stouthamer-Loeber et al., 1993). The current study adds to the discussion of these terms and to the development of methodological approaches to studying protective factors. This study also seeks to explain how self-control could be linked with corporal punishment and aggression and how positive teacher-child relationships could protect a young person from developing increased aggression after having experienced corporal punishment. This research will explore theoretical perspectives of Social Information Processing, Strain Theory, and Life-Course theory when considering the development of adolescent aggression and the link with corporal punishment. Although these theories have been used in studies of youth aggression in the past (Paolucci & Violato, 2004), they have been less often used to consider the absence of youth aggression with the risk factor being corporal punishment. Criminological explanations of risk factors and adolescent aggression have increasingly highlighted the importance of protective factors in general but also have identified the importance of considering developmental stages and the temporal order of protective factors in relation to those risk factors (Dubow, Huesmann, Boxer, & Smith, 2016; Fontaine, Brendgen, Vitaro, & Tremblay, 2016). This study offers a contribution to the literature by including longitudinal data and conducting autoregressive cross-lagged panel analyses when investigating protective factors. This type of methodological approach allows me to account for previous levels of aggression when examining main effects and also to address issues around temporal order of risk and protective factors. The analyses for this study are based on the Zurich Project on the Social Development of Children and Youths (Z-proso) which is a combined longitudinal and intervention study. Z-proso is the study of the development of aggression and other antisocial behaviour that was set up in a culturally diverse urban context in Europe and will be discussed in more detail in Chapter 4 (e.g. Eisner, Ribeaud, Jünger, & Meidert, 2008; Ribeaud & Eisner, 2010)

The following chapters shape the theoretical considerations of the current study and include a detailed discussion of the development of adolescent aggression as well as more recent literature regarding the use of corporal punishment. Furthermore, careful consideration of the link between corporal punishment and subsequent aggression is included which consists of a discussion of causal factors explored within existing literature. A summary of the current literature surrounding protective factors is included which provides clarification of the definitions of protective factors. Throughout this thesis, it will be argued that adolescent aggression can be the result of corporal punishment; however, the effect may be reduced due to protective factors. Specifically, Chapter 2 will provide a detailed discussion of previous research which has examined the relation between

corporal punishment and aggression. Chapter 3 will introduce the concept of protective factors, present theoretical and methodological considerations and examine current empirical research. Chapter 4 outlines the methodological approaches utilised in the current study and includes an overview of the z-proso study, the sample cohorts included in the analyses and the scale measures for variables used across all empirical chapters. Chapter 5 includes the baseline model analysis which will examine the intergenerational transmission of corporal punishment as well as the empirical relation between corporal punishment and aggression within our study sample. Chapter 6 is an analysis of the protective capabilities of self-control between corporal punishment and adolescent aggression which will detail the methodological approach taken to examine self-control as a protective factor. Chapter 7 examines the protective capabilities of positive teacher-child relationships between corporal punishment and aggression. Chapter 8 concludes by discussing the main findings and future extensions to the current research study. Key conclusions are drawn which consider the main objective of this thesis, which is to identify why some individuals who experience corporal punishment become aggressive, while others do not.

Chapter 2: Corporal Punishment and Aggression

The child outcomes most often linked with corporal punishment are aggression and antisocial behaviour. Several longitudinal studies have now linked corporal punishment with an increase in subsequent aggression (Lansford et al., 2011; Lansford, Wager, Bates, Pettit, & Dodge, 2012). Corporal punishment is thought to increase antisocial behaviour because it models aggression (Bandura, 1977; Bandura, 1978), interferes with internal attributions for acceptable behaviour, and does not teach children why their behaviour was wrong or what alternative behaviours are appropriate (Gershoff, 2013). The majority of research on corporal punishment has focused on undesirable child outcomes, such as aggression or antisocial behaviour (Gershoff, 2002). More recently, increased attention has been devoted to understanding how protective factors may reduce the likelihood that a young person develops increased aggression after having experienced known risk factors. In this study, I sought to contribute to the growing literature on protective factors by examining interactive protective factors that may reduce the possibility of a child developing increased aggression after having experienced corporal punishment. Before discussing the concept of protective factors in more detail, a discussion of the link between corporal punishment and aggression is provided below.

Various theories on the development of children and adolescents highlight the importance of the role of parents in promoting social development. These processes of socialisation are important with regards to the development of early prosocial behaviour (Eisenberg, Spinrad, & Knafo-Noam, 2015). One example of this is the use of inductive reasoning, which is defined as verbal instructions, or reasons for requiring the child to change his or her behaviour (Hoffman, 1983). Previous research has found that inductive reasoning is linked to children's greater prosocial behaviour (Eisenberg et al., 2015). However, some parenting practices have been found to result in less desirable behaviours. When discussing parenting practices, there are three dimensions that have been consistently identified, such as parental warmth versus rejection and hostility, structure or behavioural control versus chaotic and inconsistent parenting, and autonomy support versus strict coercion and emphasis on obedience (Eisner & Malti, 2015; Skinner, Johnson, & Snyder, 2005). Parenting risk factors have consistently been examined by previous research as an important predictor of childhood and adolescent aggression (Hale, Van Der Valk, Engels, & Meeus, 2005; Keijsers, Loeber, Branje, & Meeus, 2011; Lansford et al., 2011; Pardini, Fite, & Burke, 2008; Taillieu & Brownridge, 2013; Topçuoğlu, Eisner, & Ribeaud, 2013). Previous research has identified several groups of parenting risk factors, including inconsistent and harsh

parental discipline, low parental involvement in children's activities, poor supervision, and lack of parental warmth or emotional support (Eisner & Malti, 2015; Loeber & Hay, 1997; Olson, Lopez-Duran, Lunkenheimer, Chang, & Sameroff, 2011). However, according to Gershoff (2002), one of the most important child-rearing variables often linked to aggressive behaviour relates to parents' use of corporal punishment. Previous research has found that parenting practices that included punitive interactions, such as yelling and threatening, were also associated with disruptive behavioural problems such as aggression, as well as internalizing problems like depression (Stormshak, Bierman, McMahon, & Lengua, 2000). However, physically aggressive parenting specficially predicted child aggression.

Aggression, defined as 'any form of behaviour directed toward the goal of harming or injuring another living being who is motivated to avoid such treatment' (Baron & Richardson, 1994) has been found to increase the risk of problem behaviours later in life. These include physical violence, delinquency, relational problems, adult aggression and offending (Côté, Vaillancourt, LeBlanc, Nagin, & Tremblay, 2006; Pouwels & Cillessen, 2013; Wildeboer et al., 2015). These negative outcomes can lead to both emotional and financial implications to victims or members of society. Aggression and violence are often considered separately, with violence being defined as 'severe physical aggression that is likely to cause serious damage or injury' (Marcus, 2017, p.7).

When examining various risk factors of youth aggression, it is important to consider the young person's developmental stage. Years of developmental research of aggression has highlighted that the degree of risk in developing increased aggression can depend on the presence or absence of other factors. Moreover, the strength of certain risk factors can often depend on the stage of the young person's development (Dubow et al., 2016; Fontaine et al., 2016; Kim, Gilman, Hill, & Hawkins, 2016; Moffitt, Caspi, Dickson, Silva, & Stanton, 1996). For example, during pre-school and early adolescence, the family environment may have a greater influence when looking at the immediate impact of parental discipline practices. This is because during the pre-school and early adolescence age, the presence of the young person's parents in their life is far greater. Furthermore, it is around the age of 11 that adolescents are learning to inhibit aggressive impulses as they develop increased cognitive control. Furthermore, young person within this stage of early adolescence are experiencing rapid hormonal change as well as sensation seeking which could heighten sensitivity to social influences (Benson and Buehler, 2012). As the young person develops and enters the stage of later adolescence (age 15+), these hormonal changes may become more intense which could increase their levels of aggression as well as sensitivity to social influences. Moreover, during later adolescence, peers may have a stronger influence due

to the increased amount of time the young person spends out of the home. Taking this into consideration, the following section provides a more detailed discussion of the link between corporal punishment and aggression.

Corporal Punishment Increases Aggression

Corporal punishment is defined as the ‘use of physical force with the intention of causing a child to experience pain, but not injury, for the purposes of correction or control of the child's behaviour' (Straus & Donnely, 2001, p.4). The most commonly used forms of corporal punishment are spanking, slapping, shoving a child roughly, and hitting with certain objects (i.e. belt). The definition of corporal punishment and physical abuse differ in that the former does not intend to injure, whereas the latter does (Al-Modallal, Peden, & Anderson, 2008; Cruise, Jacobs, & Lyons, 1994). Research has found that corporal punishment can lead to increased adolescent aggression because it models aggression (Bandura & Walters, 1959; Gershoff, 2002; Patterson, 1982), promotes hostile attributions, leads to poor emotional regulation, negative social information processing (Weiss, Dodge, Bates, & Pettit, 1992) and can increase reciprocal instances of aggression between the child and the parent (Gershoff, 2002). At the time of writing, all forms of corporal punishment have been prohibited in 53 countries (endcorporalpunishment.org) with Scotland, England and Wales being the most recent countries to announce proposals to ban spanking in early 2018. However, regardless of it being banned, there is evidence that it does still occur. Many laws stipulate that if the punishment is 'reasonable' then it is 'acceptable' (Cope, 2010). However, the law does not refer to the long-term effects that corporal punishment could have. While corporal punishment is accepted in some countries as long as it does not cause physical damage, there is less regard to the emotional or behavioural damage, although it is heavily debated whether it should be banned entirely due to its negative long-term effects (Schrock, 2010). A popular debate regarding corporal punishment is whether or not there is a causal mechanism that leads to increased aggression in adolescence which will be discussed below (Evans, Simons, & Simons, 2012; Herrenkohl, Huang, Tajima, & Whitney, 2003; Lansford et al., 2014; Lee, Altschul, & Gershoff, 2015).

Causal Mechanisms

If experiencing harsh forms of discipline is an important precursor to aggression, it is imperative that we understand the mechanisms by which this occurs. While some have examined the correlation between corporal punishment and adolescent aggression, others have focused on

identifying possible causal mechanisms (Evans et al., 2012; Herrenkohl et al., 2003; Simons & Wurtele, 2010; Weiss et al., 1992). The goal of the following section is to discuss a selection of the causal mechanisms that could articulate the link between corporal punishment and aggression. It is acknowledged that other plausible causal mechanisms not included below could exist.

Emotional Regulation, Social and Cognitive Skills

One example of the mechanism by which corporal punishment can increase aggression is through the effect on emotional regulation. Emotional regulation is the process through which individuals control which emotions they have, when they have them and how they experience and express these emotions (Calvete & Orue, 2012; Gross, 2007). These emotions can be extrinsic when another person helps to regulate the person's emotions, or intrinsic (automatic or effortful) when a person regulates his or her own emotions (Sheppes et al., 2014). Being unable to regulate one's emotions has been found to be related to several forms of psychopathology (Aldao, Nolen-Hoeksema, & Schweizer, 2010). With regards to emotional regulation being related to aggressive behaviour, previous studies have found that aggressive adolescents often use less effective emotional regulation methods than non-aggressive adolescents (Calvete & Orue, 2012; Nas, Orobio De Castro, & Koops, 2005).

More specific to this study, it has been found that poor emotional regulation could explain how adverse parenting practices contribute to poor adolescent adjustment (Eisner & Malti, 2015; Morris, Silk, Steinberg, Myers, & Robinson, 2007). It has been argued that harsh parenting practices are often associated with poor emotional regulation of the adolescent. Poor emotional regulation is then associated with aggressive behaviour from early childhood onwards. It has been argued that children are more likely to develop aggressive behavioural patterns if they have shown deficits in affective regulation and impulse control (Krahé, 2001). These deficits make it more difficult to constrain their aggressive impulses and they are then often perceived as having a difficult temperament. The knock-on effect of this is that children can be treated differently by their social environment based on their temperament. Furthermore, emotional regulation has been found to be a mediator between known risk factors and externalizing behaviours. For example, it was found that age three self-regulation mediated the link between age two low maternal warmth and age four and five externalizing behavioural problems in families with alcohol problems (Eiden, Edwards, & Leonard, 2007). Self-control was also found to be a mediator between harsh parenting in early childhood and externalizing behaviour at age 11 (Bradley &

Corwyn, 2007). Other research (Burnette, Oshri, Lax, Richards, & Ragbeer, 2012) found that the effects of harsh parenting on externalizing behaviour were partly mediated by emotional reactivity (being easily aroused) and self-control.

Poor emotional regulation has also been found to be linked to physical aggression due to its effect on internal scripts and schema (Terzian, Li, Fraser, Day, & Rose, 2015). This is due to the fact that when children who have difficulty managing their emotions encounter a social situation that is emotion-arousing, they often rely on automatic scrips and schema rather than on unique cues (Terzian et al., 2015)**.** They also tend to perceive fewer cues, generate fewer solutions and are more likely to select aggressive responses (Eisenberg et al., 2001; Terzian et al., 2015). Furthermore, adolescents with deficits in emotional regulation skills are more likely to display strong affect which can elevate risk for peer rejection and victimisation (Hubbard, 2001) and experience poor overall psychosocial adjustment (Terzian et al., 2015; Wyman et al., 2009)**.** The link between corporal punishment and the development of negative social scripts will be further explored when discussing social information processing, below.

Various individual-level moderators have been identified which moderate the effects of parenting on externalizing problems (Eisner & Malti, 2015). These include variables such as temperament and emotional regulation (Rubin, Burgess, Dwyer, & Hastings, 2003) or biological and reactivity to context (Eisner & Malti, 2015; Erath, El-Sheikh, Hinnant, & Cummings, 2011). For example, when children with dopamine D4 receptor (DRD4) 7-repeat polymorphism were exposed to insensitive parenting, they demonstrated increased externalizing behaviours (Bakermans-Kranenburg & van IJzendoorn, 2006). Furthermore, it was found that biological indicators of self-regulation such as biological sensitivity to context, skin conductance reactivity (SCLR) and respiratory sinus arrhythmia (RSA), also moderated the association between harsh parenting and the development of externalizing behaviour (Eisner & Malti, 2015). For example, it was found that boys with lower SCLR and harsh parenting maintained high and stable externalizing behaviour from age one to age ten while externalizing behaviour increased from age 8 to age 10 in boys with SCLR and harsh parenting (Eisner & Malti, 2015; Erath et al., 2011). It could also be the case that a considerable part of the shared variance in poor parenting and poor child outcomes is likely due to shared genetic factors (Moffitt, 2005). Aggressive adolescents could be at risk of abusive or neglectful parents, not because poor parenting is the cause of aggression, but because harsh and unresponsive parenting and aggressive child and adolescent behaviour share the same genetic roots.

Another possible causal link between corporal punishment and subsequent aggression is through social and cognitive skills (Eisner & Malti, 2015). Dodge et al. (2015) examined the causal mechanisms between corporal punishment and subsequent adolescent aggression. Their findings suggested that family social disadvantage predicted harsh and inconsistent parenting, low supervision and poor parent-child attachment. This in turn, predicted social and cognitive deficits which predicted conduct problem behaviour. When children enter formal schooling with social and cognitive deficits they are more likely to display conduct behavioural problems. High levels of conduct problems predict social and academic failure in elementary school, which in turn predicted parental withdrawal from supervision. Low parental supervision was associated with deviant peer associations which then predicted increased adolescent aggression. Furthermore, studies have found that if children lack social and cognitive skills and do not learn to regulate physical aggression during pre-school years, they are likely to develop increased levels of physical aggression later in life (Tremblay, 2004). This is due to the fact that if children see aggression as a legitimate form of social behaviour, they are more likely to demonstrate higher levels of physical aggression themselves (Erdley & Asher, 1998).

Social Information Processing

There have been many studies based on various theoretical models that illustrate how social information processing is important when examining adolescent aggression and social adjustment (Akhtar & Bradley, 1991; Crick & Dodge, 1994; Huesmann, 2018; Lösel, Bliesener, & Bender, 2007). The social information processing theory was first introduced by Dodge (1986) and later reformulated by Crick and Dodge (1994). The model developed by Dodge (1986) is one of the most heavily studied models of aggression development (Calvete & Orue, 2012).

While there is not yet one common theory of social information processing with regards to aggressive adolescents, Crick and Dodge (1994) have integrated various constructs based on previous studies of adolescent aggression. According to the social information processing models, child and adolescent behaviour is a function of sequential steps of cognitive processing (Crick & Dodge, 1996). The first step in this sequence is *to perceive and encode situational and social cues* (Crick & Dodge, 1994). However, when aggressive adolescents encode situational cues, they tend to focus more on aggressive-relevant stimuli (Lösel, Bliesener, & Bender, 2007). Aggressive children and adolescents in ambigious social situations tend to selectively encode or attend to cues that are more associated with hostile intentions (Calvete & Orue, 2012). The

second step in the sequence is to *form a mental representation and intrepretation of the situation.* With regards to aggressive adolescents, it has been argued that they are less able to recognize the specific intentions and motivations of others, and they often have a tendency to attribute hostile intentions to the provocateur (Lösel, Bliesener, & Bender, 2007; Calvete & Orue, 2012). The third step is to *select a goal or desired outcome for the interactions.* Goal selection has been found to be more egocentric for aggressive adolescents (Coie et al., 1999) who may be more likely to select hostile or revenge goals (Calvete & Orue, 2012). *Recall or construct possible reactions to the situation* is the fourth step in the sequence. Aggressive adolescents tend to generate more aggressive and hostile responses (Calvete & Orue, 2012). This is due to the fact that their repertoire of reactions lacks variety and is dominated by aggressive and impulsive reactions. The fifth step is to *evaluate reactions*. Those with aggressive behavioural characteristics often have more short-term estimations of consequences to their actions (Gottfredson & Hirschi, 1990). They have been found to evaluate aggressive responses more favourably (Calvete & Orue, 2012), and seem to expect more positive outcomes from aggressive behaviour (Calvete & Orue, 2012; Zelli, Dodge, Lochman, & Laird, 1999). This could be derived from beliefs and experiences learned within the family context, such as corporal punishment. The final step is to *initiate what they expect to be an adequate action* and aggressive children have been found to have fewer social skills for engaging in nonaggressive interactions (Lösel, Bliesener, & Bender, 2007).

The social information processing model suggests that the sequence of cognitive processes is inferred from contents of the memory store and social schemata. This is attributed mainly to social learning (Bandura, 1977; Bandura, 1978) and is influenced by experiences of aggression, conflict, physical punishment and poor parenting. For example, Lösel, Bliesener and Bender (2007) conducted a prospective longitudinal design with adolescents and examined whether the characteristics of social information processing related to experiences of aggression in social contexts such as the family. Their study, which included a sample of 102 male adolescents, supported the model of social information processing and found that the main relationship to aggression was due to the stage in social information processing that related to 'aggressive-impulse response schemata from memory store'.

Aggressive reactions to social situations can be further explained by social cognitive approaches which examine aggressive scripts and social information processing. According to Huesmann (2018), social scripts are behavioural repertoires which control social behaviour based on

expectations of social situations and those involved. If children have repetitively responded or seen others respond to undesirable social situations in an aggressive manner (such as corporal punishment when a child is behaving undesirably), they are likely to develop a behavioural repertoire which is more in favour of aggressive conflict resolution in the future. Based on this, it could be postulated that if children experience their parents responding to undesirable behaviours with corporal punishment, it may result in them developing a behavioural repertoire that leads them to react to conflicts in a more aggressive way. In addition to an individual's behavioural 'script', cognitive processing of social situations is an important factor when examining aggressive responses. Studies have shown that those with a history of aggressive behaviour will often interpret social situations in a more aggressive manner (Krahé, 2001). This is referred to as 'hostile attribution bias' and can lead to the activation of an aggressive script and increase the probability of an aggressive reaction (Krahé, 2001). For example, in a longitudinal study by Salzer Burks, Laird, Dodge, Pettit, & Bates (2001), levels of aggression in kindergarten and grade 8 were obtained by individuals' mothers and teachers. In grade 8, children's attributions of hostile intent were measured in response to hypothetical conflict scenarios. Salzer Burks et al. (2001) found that children who had hostile knowledge structures were rated as more aggressive by their mother and teacher. They also found that hostile knowledge structures mediated the link between early childhood aggression and aggressive behaviour in grade 8. Their results suggested that there are individual differences with regards to aggression which could be the result of information processing in favour of aggressive responses to social cues.

Previous research has applied the model of social information processing to examine the causal link between corporal punishment and subsequent aggression. For example, using a prospective design with randomly selected samples split into two separate cohorts, Weiss et al. (1992) found that in each of their cohorts, early corporal punishment was positively correlated with child aggressive behaviour. To explain the association, Weiss et al. (1992) examined social information processing and found that higher levels of harsh discipline were associated with greater processing biases and difficulties. They found that in both cohorts, increased corporal punishment was associated with less attention to relevant social cues and an increase in aggressive responses to hypothetical interpersonal problems. In the first cohort, greater corporal punishment was also significantly associated with increased hostile attribution biases. Weiss et al. (1992) found that temperament and socioeconomic status did not appear to account for the relation between physical harm and later aggression. However, they found that the effect of harsh

discipline on aggression was partially mediated by social information processing, suggesting effects on information processing acts as a causal mechanism.

There is also evidence of a lagged effect with regards to exposure to corporal punishment and adolescent aggression. For example, in a prospective study by Herrenkohl et al. (2000) which assessed parental discipline practices, adolescents were asked about their aggressive behaviours (i.e. being in gang fights, hitting others). Their research found that increased severity of corporal punishment at the preschool age resulted in increased levels of physical assault in late adolescence. In a later study, Herrenkohl, Hill, Chung, and Guo (2003) examined additional prospective and retrospective measures of physical discipline. They found that corporal punishment predicted violent behaviour indirectly through variables that reflect attitudes about the use of violence. They found that abuse was an important predictor of violence during adolescence; however, most of the explanatory power is from proximal variables such as school commitment and antisocial peer involvement. For example, in their structural equation model analysis examining causal mechanisms, they found that socioeconomic status predicted abuse, which in turn, predicted attitudes about the use of violence. Attitudes about the use of violence then predicted adolescent involvement with antisocial peers, which in turn, predicted violent behaviour. In their prospective abuse model, parental attachment and school commitment were less important in the mediation of abuse on later violence when compared to violent attitudes and peer involvement.

Increased Levels of Strain and Frustration

Another way to examine causal mechanisms between corporal punishment and aggression is through the application of Strain Theory and the frustration-aggression hypothesis. For decades, it has been argued that aggression is the result of frustration which can be triggered when an individual is unable to reach desired goals or has a drive to end a state of frustration caused by an external interference (Groves & Anderson, 2018). General Strain Theory (Agnew, 1985, 1992) focuses on aggression in psychology, including events of frustration-aggression. It focuses on negative relationships with others, including relationships where an individual is not treated in the manner they wish to be treated. This, in turn, creates feelings of strain and frustration and can lead to problematic behaviour such as aggression. In addition to focusing on relationships that prevent the individual from achieving positively valued goals or removing positively valued stimuli, strain theory also includes those relationships that present a noxious or negative stimuli, which can be actual or anticipated. Relationships that include a noxious or negative stimuli are ultimately

defined from the perspective of the individual involved; adverse relations are whatever the individual says they are. With regards to adolescents, this negative stimuli may increase frustrations as they are usually unable to fully escape from the relationship that is causing the negative stimuli. Agnew (1985) has argued that adolescents find it difficult to escape legally from negative stimuli, especially negative stimuli encountered in the family, and they often lack the resources to negotiate successfully with adults, such as their parents. Noxious or negative stimuli, such as corporal punishment, has been linked to increased aggression in adolescents (Agnew, 1992) because of this inability to escape. Furthermore, if negative stimuli, such as corporal punishment, is repeated or chronic, it may lead to a 'hostile attitude, a general dislike and suspicion of others and an associated tendency to respond in an aggressive manner' (Agnew, 1992).

Not every frustration leads to aggression; it can sometimes lead to depression or withdrawing from the situation. Moderating variables can influence whether or not the outcome of experiencing frustration is aggression (Krahé, 2001). It is sometimes the case that an individual will fear being punished for overt aggression, thus they will not respond to frustration in this way. For example, if an adolescent's level of frustration is the result of experiencing corporal punishment, they might not respond with overt aggression to the source of their frustration (i.e. their parents) for fear of further punishment. This might also explain why aggression is sometimes displaced; that is, the individual who is experiencing the frustration may respond by taking out their aggression on someone other than the 'frustrater' (Krahé, 2001). This person might be someone who is more easily accessible or less intimidating, such as a peer.

The explanation for displacement is also found in equity literature (Agnew, 1992) which suggests that experiencing corporal punishment could result in an inequitable relationship (one individual feels they have been unfairly treated). Thus, problematic behaviour may be the result of restoring equity. In highly inequitable relationships, individuals may displace their strain or frustrations on others. It has been argued (Agnew, 1992) that attempts to restore equity do not have to involve the specific others in the inequitable relationship. The person who feels they have been inequitably treated may attempt to restore equity in the context of an entirely different relationship (Agnew, 1992). The adolescent who is inequitably treated by parents, for example, may respond by inequitably treating peers, thus displacing their frustrations. The concept of displaced aggression is also evident in Zillmann's Excitement Transfer Theory (Zillman & Bryant, 1974). For example, Zillmann's Excitement Transfer Theory suggests that an individual's aggression could

be triggered by a person unrelated to the original source of negative arousal and thus the aggression is then transferred or mis-attributed towards that unrelated person. According to Zillman and Bryant (1974), individuals who experienced a previous negative arousal and carried this 'residual arousal' into an unrelated social situation were more likely to respond aggressively when compared to the 'non-aroused' individuals.

The discussion of frustration-aggression, strain and the link between corporal punishment and aggression can be further strengthened with consideration of the General Aggression Model (Allen, Anderson, & Bushman, 2018). The general aggression model is a comprehensive, integrative framework for understanding human aggression (Allen et al., 2018). It unifies theories such as cognitive neoassociation theory, social learning theory, script theory, excitation transfer theory and social interaction theory. It considered the roles of social, cognitive, developmental, and biological factors on aggression (Allen et al., 2018). According to the General Aggression Model, pre-existing knowledge structures can heavily influence levels of aggression. This is because knowledge structures affect social-cognitive phenomena such as perception, interpretation, decision and behaviours (Allen et al., 2018). According to Allen et al., (2018), 'some of the most important knowledge structures include beliefs and attitudes (e.g. believing aggression is normal, evaluating it positively), perceptual schemata (perceiving ambiguous events as hostile), expectation schemata (e.g. expecting aggression from others) and behavioural scripts (e.g. believing that conflicts should be resolved with aggression)'. Through experience, these knowledge structures are developed and can influence a person's perceptions. This can help explain why those who have experienced previous frustration are more likely to respond in a more aggressive way. This is especially the case when they are faced with 'aggression-related cues' when compared to those who had not previously experienced frustration (Krahé, 2001). Those with a hostile-attribution or more aggressive scripts will respond to frustrations in a more aggressive way. That is to say, those who have experienced corporal punishment may develop behavioural scripts that are more in favour of aggressive responses to conflict. Moreover, those who have experienced corporal punishment are experiencing an increased level of frustration which may result in them acting in a way towards others that releases this frustration or rebalances what they believe is an inequitable relationship with their parents. Thus, the end result is that adolescents who are exposed to corporal punishment develop more aggressive behavioural scrips and reactions to conflict, and in turn, are more likely to act aggressively towards others.

Examining the link between corporal punishment and subsequent aggression is also important with regards to an increased risk of re-victimisation later in life. Research has found that experiencing corporal punishment can lead to increased re-victimisation due to the impact that corporal punishment has on increased aggression. Hosser et al. (2007) found a clear connection between those who experience maltreatment or serious physical punishment as children and an increased risk for later victimisation during adolescence. They suggest this was partly because of the 'trauma-induced offence cycle'. The trauma-induced offence cycle is comparable with social information processing and elements of strain theory; previous abuse and trauma can make an individual react to situations triggering trauma-related effects with a heightened sense of fear, aggression, sense of helplessness, and a heightened risk of violent 'reactions and re-victimisation furthering sensitivity to trigger situations' (Hosser et al., 2007). In general, the trauma-induced offence cycle intensified fear and anxiety within an individual who previously experienced victimization and increases their chances of a violent outburst, which in turn increases the likelihood they will be re-victimised. While the purpose of the current study is not to examine re-victimisation, Hosser et al. (2007) do lend support to the argument that corporal punishment can lead to increased violent outbursts and aggression in later adolescence.

Empirical Studies of the Association between Corporal Punishment and Aggression

In addition to theoretical explanations of the causal mechanisms between corporal punishment and aggression, there are also various empirical studies that explore this association. There is a long history of research showing a relation between corporal punishment and adolescent aggression (Evans et al., 2012; Gershoff, 2002; Lansford et al., 2007; Lee et al., 2015; MacKenzie, Nicklas, Brooks-Gunn, & Waldfogel, 2015). The association between corporal punishment and aggression is evident in studies that include various age groups. With regards to very young children, Lee et al. (2015) assessed the association of fathers spanking at ages one, three and five and child aggression at ages three and five using a cross-lagged panel model. They found that paternal spanking was correlated with child aggression within the same time point when children were aged three and five; however, spanking at age one did not predict levels of aggression at age three, suggesting there was an immediate association between spanking and aggression, but no lagged association. When examining their cross-lagged model of maternal spanking, Lee et al. (2015) found that maternal spanking at age three was predicative of increased child aggression between ages three and five, which indicates both an immediate effect of corporal punishment and aggression within the same time point, as well as a lagged effect. Taylor,

Lee, Guterman, and Rice (2010) examined the association between corporal punishment against children who were three years old and their subsequent aggressive behaviour. They found that, even when initial levels of aggressive behaviour and confounding risk factors were controlled for (such as child neglect, intimate partner aggression or violence, maternal parenting stress, depression and use of substances), the frequent use of corporal punishment whilst the child was three was found to be associated with an increased risk of higher levels of aggression when the child reached the age of five. Taylor et al. (2010) also noted that even minor forms of corporal punishment as a use of discipline increased the risk of subsequent aggression.

Corporal punishment has been found to have potentially different effects depending on the developmental stage of the young person experiencing it. For example, in a meta-analysis of 88 studies, Gershoff (2002) specified that corporal punishment is related to aggression and antisocial behaviour; however, the impact of corporal punishment differed across age groups. Gershoff (2002) found that 10 of the 11 meta-analyses conducted indicated parental corporal punishment was associated with undesirable behaviours such as:

> 'decreased moral internalization, increased child aggression, increased child delinquent and antisocial behaviour, decreased quality of relationship between parent and child, decreased child mental health, increased risk of being a victim of physical abuse, increased adult aggression, increased adult criminal and antisocial behaviour, decreased adult mental health, and increased risk of abusing own child or spouse' (p.544).

Approximately 30% of the studies examined in the meta-analysis included a target child between the ages of 10 and 16 with results indicating that the older the child was, the more likely there was an association between corporal punishment and negative outcomes. In her meta-analysis, Gershoff (2002) found studies that reported stronger associations between corporal punishment and aggression were those that included samples averaging from 10 to 12 years of age. Moreover, Deater-Deckard & Dodge (1997) assert that the effects of corporal punishment on subsequent aggression may be non-linear. This means that corporal punishment may have differential effects on children at different stages of their development. For example, Strauss and Donnely (1994) argue that corporal punishment is less normative in school aged children, thus when it is administered to school aged children, it may have a stronger effect than if they were younger (preschool). However, it may be the case that those who are in later adolescence and display more aggressive behaviours elicit more corporal punishment from their parents when compared to children in preschool (Gershoff, 2002). Furthermore, stronger associations among older adolescents than among those who are younger may also reflect cumulative effects of

exposure to corporal punishment. Finally, smaller associations were found for those in high-school which could be due to the fact that corporal punishment for high-school students is fairly rare (Gershoff, 2002).

Corporal punishment has also been found to be associated with increased adolescent aggression even when accounting for other factors and previous levels of aggression. The link between corporal punishment and adolescent aggression has been found in studies that have controlled for the effects of potentially confounding variables, such as ethnicity (Lansford, Deater-Deckard, Dodge, Bates, & Pettit, 2004), family composition (Molnar, Buka, Brennen, Holton, & Earls, 2003) and neglectful parenting (Knutson, DeGarmo, & Reid, 2004). For example, it was found that children who were spanked had higher levels of aggressive behaviour, even when their mothers were high in warmth (Lee, Altschul, & Gershoff, 2013). Weiss et al. (1992) found that corporal punishment predicted subsequent aggression even after controlling for adolescent temperament, socioeconomic status and marital violence. Furthermore, studies have found that corporal punishment increases adolescent aggression even when accounting for previous levels of aggression (Altschul, Lee, & Gershoff, 2016)**.** For example, Altschul et al. (2016) found that spanking was associated with increased child aggression over and above children's initial levels of aggression. They assessed within- and across-time associations between maternal and child behaviours using nested, cross-lagged path models. Their longitudinal study included 3,279 families with young children and tested whether maternal spanking predicted social competence and decreased child aggression over time. Their results indicated that spanking was not associated with social competence. Instead, spanking was found to predict an increase in child aggression. The reason why spanking is more predictive of aggression and not increased social competence might be because spanking does not include direct messages about socially competent behaviour and instead models aggression as a means of solving interpersonal conflicts (Altschul et al., 2016).

Gender differences in the Effects of Corporal Punishment

It has been well documented that men are often more aggressive than females (Krahé, 2001; Gershoff, 2002; Marcus, 2017) and research consistently finds that gender predicts aggressive behaviours (Marcus, 2017). Within the developmental literature, gender refers to learned differences between males and females which are, in most cases, culturally defined (Marcus, 2017). Developmental research reports that gender differences in aggressive behaviour emerge early in life, around the age of three (Coie & Dodge, 1988). Gender differences in aggression

have also been found to be present from pre-school age onwards with boys displaying higher levels of aggression (Loeber & Stouthamer-Loeber, 1998). For example, in a meta-analysis of 68 longitudinal studies, it was found that from childhood to age 15-25, gender was the best predictor of aggression in mid-late adolescence when compared with family, behavioural, personality and other social factors (Lipsey and Derzon, 1999, cited in Marcus, 2017). There have also been gender differences with regards to the type of aggression displayed. Bjorkqvist and Niemela (1992, cited in Krahé, 2001) found that girls may be more likely to engage in more indirect forms of aggression, such as recreational aggression (e.g. excluding others and spreading gossip).

There have also been gender differences found with regards to the association between corporal punishment and aggression. For example, Gershoff (2002) suggests that there may be a stronger association between corporal punishment and aggression for boys as boys tend to exhibit aggression more than girls and also may elicit more corporal punishment from parents than do girls. Previous research has found that the frequency of spanking is higher for boys than for girls (Straus & Stewart, 1999) and that girls are less likely to experience corporal punishment than boys (Taylor et al., 2010). Many studies consider gender as a control. However, there is value in considering males and females in split groups to determine whether or not mechanisms differ between genders. Within their analysis, Evans et al. (2012) used structural equation modelling to test for significance of indirect effects and ran models separately by gender. Associations for corporal punishment differed by gender; for males, corporal punishment was associated with delinquency, self-control and hostile views of relationships, and for females, corporal punishment was only related to hostile views of relationships. For both males and females, self-control and hostile views of relationships showed a significant association with delinquency. Evans et al. (2012) also found that corporal punishment had a significant effect on delinquency for males only. Furthermore, for males, corporal punishment showed an indirect effect through both low self-control and hostile views of relationships, however for females, corporal punishment did not have a significant effect on any of the mediators. Significant sex differences in the link between spanking and antisocial behaviour were also found in a study by Straus, Sugarman, and Giles-Sims (1997) which used data on 807 children between the ages of 6 and 9 years old. For both males and females, the frequency of spanking at Time 1 was associated with higher levels of antisocial behaviour two years later, but the link was more linear and stronger for boy than it was for girls. Furthermore, Gunnoe and Mariner (1997) used data on 1,112 children between the ages of four years and 11 years old and found that spanking predicted significantly less aggressive

behaviour for girls, five years later. However, for boys, it was found that the path was positive and non-significant.

It could also be the case that boys might be more vulnerable than girls to the adverse effects of corporal punishment. Topçuoğlu, Eisner, and Ribeaud (2013) investigated sex differences in the risk status of corporal punishment using data on 697 school children while controlling for a large number of covariates, including prior child behaviour problems. Using the propensity score matching technique, Topçuoğlu et al. (2013) found significant sex differences, with boys who experienced corporal punishment at age nine displaying increased levels of aggression during the following two years. The study found no significant association for girls. It may be the case that differential socialisation processes of aggression in boys may add to boys' 'biological weaknesses and partially account for boys' differential reactions to corporal punishment' (Topçuoğlu et al., 2013).

Parents who decide to use Corporal Punishment

Regardless of there being years of research highlighting the negative effects of corporal punishment, many still administer it. As previously mentioned, at the time of writing, all forms of corporal punishment have been prohibited in 53 countries (endcorporalpunishment.org) with Scotland, England and Wales being the most recent countries to announce proposals to ban spanking in early 2018. However, in a report by Straus and Gelles (1990 cited in Krahé, 2001), nearly 100 per cent of parents of young children reported having hit their child at least once in the preceding year. It was also found in another study that 80 per cent of respondents either agree or strongly agree with the opinion that it is acceptable to discipline a child with a hard spanking (Ellison & Sherkat, 1993). In a later study, it was estimated that more than 90 percent of parents use corporal punishment on toddlers and more than half continue to use it during early teen years (Paolucci & Violato, 2004). In a more recent study (Taylor et al., 2016), public comments on a news article indicated that 70% of respondents approved the use of corporal punishment and justified their responses with comments such as 'I was spanked and I am ok' or 'I am not aggressive and I was spanked'. Others suggested that today's generation lacked discipline and corporal punishment was needed as a means to correct this. The prevalence of corporal punishment does decrease with age; however, it continues to remain high even into adolescence (i.e. 33% at age 14, 13% at age 17) (Harper, Brown, Arias, & Brody, 2006; Straus & Stewart, 1999).

There are various opinions on the appropriateness of the use of corporal punishment when correcting or controlling the behaviour of young people. The impact that the use of corporal punishment has on a young person can be influenced by the intended goals of the person administering it. Some parents believe that spanking is an effective way to promote better behaviour in their children. In one study, 2% of respondents endorsed the belief that spanking did improve their child's behaviour and 22% believed that other forms of discipline were not as effective as spanking (Taylor et al., 2016). Even when parents are made aware of the potential harms associated with corporal punishment, parental agreement with social norms that support the administration of corporal punishment still remains a strong predictor of corporal punishment (Taylor, Hamvas, Rice, Newman, & DeJong, 2011). This demonstrates that social norms and beliefs in support of corporal punishment outweigh empirical research demonstrating otherwise.

As discussed above, social information processing has been found to be one of the factors leading to the development of aggression or aggressive reactions to certain situations. The same concept can be applied when examining the reasons why someone may administer corporal punishment. Evidence from both retrospective and cross-sectional studies which examine the link between corporal punishment and aggression have found that aggressive behaviour increases as a function of being exposed to corporal punishment (Krahé, 2001). Furthermore, adults who were considered to be violent and aggressive were more likely to have been exposed to corporal punishment in childhood when compared to non-aggressive adults (Krahé, 2001). For example, in a study including 73 mothers with children between the ages of five and twelve, McElroy and Rodriguez (2008) examined the associations between cognitive risk factors and physical discipline styles, using the Social Information Processing conceptual framework. Their results indicate that the parent's ability to empathise with the child, parent's level of frustration tolerance and parental locus control were significant predictors of administering corporal punishment (R^2= .64, F (6,65) = 17.14, p <.05). These results are important to note, given the previous discussion regarding the development of adolescent aggression also included constructs of negative social information processing. This highlights the importance of identifying the relation between corporal punishment and adolescent aggression and disrupting the cycle of aggression. If corporal punishment is leading to increased adolescent aggression via negative social information processing, and parental negative social information processing significantly predicts the administration of physical discipline, then identifying protective factors and preventing subsequent adolescent aggression could disrupt the cycle displayed in Figure 1 as illustrated in Figure 2.

Figure 1: Cycle of Corporal Punishment and SIP Theory

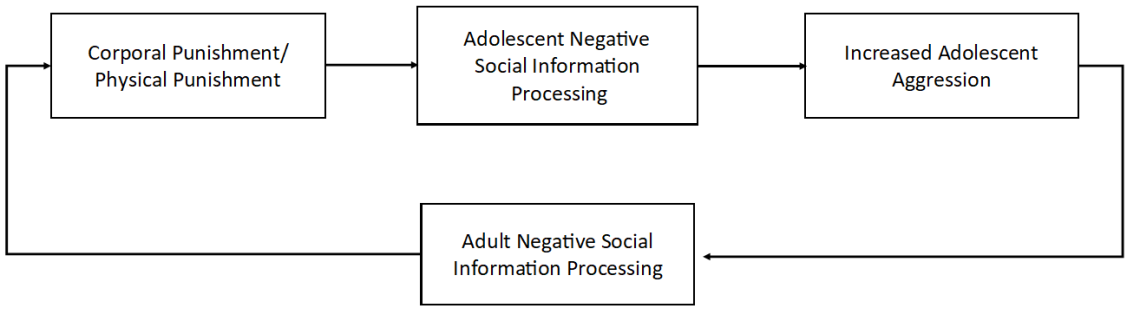
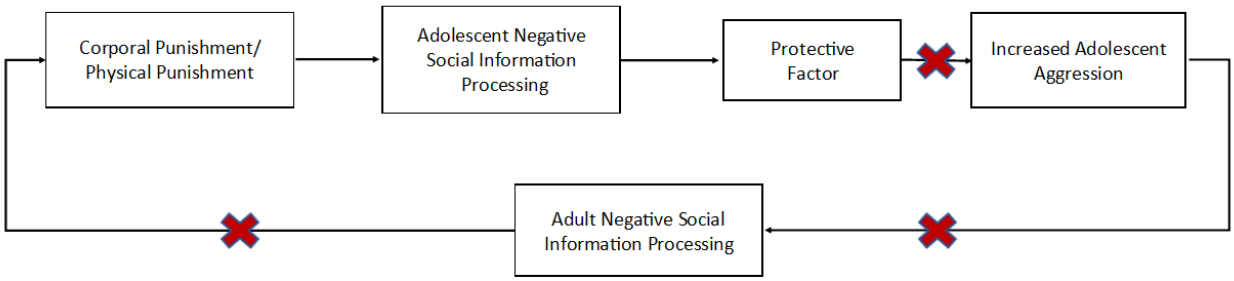


Figure 2: Disrupted Cycle of Corporal Punishment Using SIP Theory



As discussed above, previous research has found that parents who experienced corporal punishment themselves were more likely to administer corporal punishment to their own children (Niu et al., 2018). This is an example of the intergenerational transmission of corporal punishment, which can be defined as 'the process through which, purposively or unintentionally, the generation's parenting attitudes and behaviour are psychologically influenced by the earlier

generation' (Niu et al., 2018). Harsh parenting can be transmitted from one generation (i.e. grandparents) to the next (i.e. parents) (Bailey, Hill, Oesterle, & Hawkins, 2009). As discussed, one of the most commonly reported characteristics of physically punitive parents is that they have a history of experiencing physical punishment themselves (Muller et al., 1995). Muller et al. (1995) propose a model that demonstrates the intergenerational transmission of corporal punishment through the operation of social learning principles. This model suggests that an individual's tendency to manifest aggressive behaviour across the lifespan is simply a consequence of an observational learning process that takes place when they have received corporal punishment from their parents. For people who are currently parents, receiving greater levels of corporal punishment from their own parents will influence a greater manifestation of their own aggressive behaviours. Furthermore, children who experience corporal punishment from their parents are then more likely to develop subsequent aggressive behaviours.

With regards to the intergenerational transmission of corporal punishment, there is evidence that suggests that individuals are more likely to act based on their own experiences of corporal punishment when administering corporal punishment to their own children (Taylor et al., 2016). For example, Gagné, Tourigny, Joly, and Pouliot-Lapointe (2007) examined attitudes of the use of corporal punishment by questioning 1,000 adults on their views of spanking. The results indicated that adults who were most in favour of using corporal punishment were those who had been frequently spanked themselves in childhood (Gagné et al., 2007). Those who held the least favourable attitudes towards corporal punishment were those who were subject to severe physical violence or were threatened or ridiculed by their parents. However, having negative attitudes towards corporal punishment did not stop those individuals from administering it themselves. This leads to the conclusion that it is not just a person's attitude towards corporal punishment that dictates whether or not they administer it, but there are other factors that also influence the use of corporal punishment. Moreover, Simons and Wurtele (2010) examined the intergenerational transmission of corporal punishment by considering relations between parents' acceptance and use of corporal punishment and the subsequent relation between the child's experience of corporal punishment and their preference for using violence to resolve interpersonal conflict. The result showed that parents who experienced spanking as children were more likely to approve of its use, and therefore, parental attitudes about the use of corporal punishment can be transmitted to their children. They also found that children whose parents used and accepted corporal punishment were more likely to use hitting as a way of dealing with interpersonal conflicts (Simons

& Wurtele, 2010). Their results indicate that the higher the frequency of spanking in the home, the more likely the children were to say that they would hit a peer or a sibling during a conflict.

A common debate found when examining the impact of corporal punishment on subsequent behavioural outcomes is whether or not corporal punishment leads to an increase in adolescent aggression, or if childhood aggression is what triggered the use of corporal punishment (Grogan-Kaylor & Otis, 2007; Lansford et al., 2011; Lytton & Romney, 1991; Sheehan & Watson, 2008). Some argue that children are already displaying aggressive behaviours and this behaviour is not learned from experiencing corporal punishment, but instead, it increases the likelihood of receiving it (Muller et al., 1995). Others argue there is not a singular relation between discipline and aggression and they may influence each other. For example, if a child is 'naturally aggressive', this may lead a parent to discipline the child more frequently and feel the need to use more harsh forms of discipline if more mild techniques did not work. The increased use of harsh discipline may lead to an increase in aggressive behaviour from the child, creating a pattern of reciprocal influences. This could continue throughout the child's development.

Several studies have examined the question of reciprocal mechanisms between parenting and child problem behaviour. They usually require longitudinal data with repeat measurement of both corporal punishment and child aggressive behaviour. One example is the study by Sheehan and Watson (2008) who used structural equation modelling and cross-lagged panel designs to examine whether aggressive discipline predicted later aggression or whether aggression predicted an increase in corporal punishment. Results indicated that aggression at younger ages (7-13 years) predicted an increased maternal use of aggressive discipline and the use of aggressive discipline predicted an increase in child aggression at all ages. Sheehan and Watson (2008) found that the relation between parental discipline practices and subsequent aggression was not linear and that the two variables influence each other differently over time. Additionally, using the ecological framework and tobit regression analyses, Grogan-Kaylor and Otis (2007) analysed the contextual and individual factors that predicted the likelihood that a parent would use corporal punishment. They found that children who displayed greater amounts of externalizing behaviour problems were more likely to be the recipients of corporal punishment, whereas those with internalizing behaviour problems were less likely to receive corporal punishment. However, their results found that even though children's behaviour did influence their parents' use of corporal punishment, this was only one of a number of other factors. Race and ethnicity, religion, children's behaviour and parental use of cognitive stimulation were the most

consistent predictors of variation in corporal punishment frequency. As their study was cross-sectional, they were unable to ascertain causal direction. Similar results were found in a study by Lansford et al. (2011) who examined path values for a transactional model and temporal invariance in cross-lagged paths. They found a positive association between physical discipline and externalising problems at age six which showed that higher levels of physical discipline were associated with more externalising problems. Furthermore, cross-lagged paths showed evidence of a temporal relation between physical discipline at one year and externalising problems at ages seven, eight and nine. They concluded that parental use of physical discipline promotes children's antisocial behaviour more so than child antisocial behaviour affects subsequent parenting.

Support for the use of Corporal Punishment

Some argue that the use of force by parents can be effective when it is administered by emotionally supportive parents who have positive interactions with their children, within specific cultures (e.g. African American) and life circumstances (Paolucci & Violato, 2004). This was also found to be the case for uneducated parents who lacked the verbal skills needed for non-corporal discipline (Paolucci & Violato, 2004). Others have found that corporal punishment is effective in ensuring immediate compliance (Newsom, Flavell & Rincover, 1983 cited in Geshoff, 2002).

Despite the large body of research documenting the harmful impact of corporal punishment on child development, it is still often widely administered. Some academics have defended the use of corporal punishment and spanking as an effective means of discipline. For example, when addressing the limitations of previous research, Morris and Gibson (2011) use a propensity score matching design to analyse the effect that corporal punishment has on children's aggressive and delinquent behaviours. After matching children on their background characteristics and likelihood of being punished, their research suggested that corporal punishment is only marginally or not at all related to children's misbehaviour. They also found that once matched, children who received corporal punishment did not differ in aggression or delinquency scores to those who did not receive corporal punishment. Their findings also suggested that the type or frequency of corporal punishment also did not influence aggression or delinquency.

Others argue that the use of corporal punishment is an effective way to control and condition adolescent behaviour (Larzelere & Kuhn, 2005). Through conducting meta-analyses, Larzelere (2005) found that in certain circumstances, mild and occasional spanking had a positive effect on children's compliance. They also found that the effective use of corporal punishment enhanced

the efficiency of time-outs and resulted in children listening to explanations of their punishments. In response to claims that spanking is an effective means of promoting better behaviour in children, Altschul et al. (2016) examined whether or not elements of positive parenting (i.e. maternal warmth) cancelled out the negative outcomes often associated with corporal punishment when the two aspects of parenting were coupled together. Within and across time associations between maternal and child behaviours were assessed using nested, cross-lagged path models. Results indicated that mothers spanking at age three was a significant predictor of increased child aggression between ages three and five. Altschul et al. (2016) report they found no support for the argument that spanking will improve child social competence over time.

Other researchers have argued that certain circumstances in which corporal punishment is administered can have a neutralising effect on adverse outcomes. Lansford and Dodge (2008) argue that the more normative corporal punishment becomes, the less adverse outcomes there are. It is argued by some that associations between corporal punishment and behavioural problems do not occur within African-American families (Lapré & Marsee, 2016). To test whether this is accurate, Lapré and Marsee (2016) examined whether corporal punishment is associated with youth externalising problems and whether this will differ between race and the severity of the corporal punishment administered. Overall, three corporal punishment measures were used: spanking only, severe corporal punishment and total corporal punishment. Their results indicated that not only was there an association between corporal punishment and negative externalising behaviours, but this relation was moderated by ethnicity. More specifically, ethnicity moderated the associations between severe and total corporal punishment, but not for spanking (Lapré & Marsee, 2016). It was suggested that spanking is the most widely used form of corporal punishment amongst all youth in their study, therefore they are more accustomed to it and subsequently have less negative behavioural outcomes (Lapré & Marsee, 2016).

Conclusion

There is a strong amount of research showing a relation between the use of corporal punishment and subsequent aggression. As discussed above, the intergenerational transmission of corporal punishment suggests those who had experienced corporal punishment were more likely to administer it to their own children. This can lead to increased aggression, as children who experience corporal punishment may learn that aggression is acceptable in some circumstances and can be used to achieve desirable results. Studies have shown support for this theory as adults who experienced corporal punishment then used it on their own children, who then, in turn, used

aggression to solve inter-personal conflicts. However, it has also been suggested that children may already have aggressive characteristics and that this reinforces the use of corporal punishment as a method of discipline. As illustrated, corporal punishment is known to cause a range of negative outcomes such as aggression; however, it is also clear that some children do not react negatively to the use of corporal punishment. It could be argued that protective factors play a role in preventing the negative outcomes that corporal punishment affects, and one way that we could tackle the negative effects of corporal punishment is by identifying factors that both ameliorate and moderate the relation with subsequent aggression. Targeting protective factors that have both direct and indirect effects may represent particularly efficient and sustainable ways to tackle aggression risk in high risk groups. As such, the choice of candidate risk or protective factors to target within interventions need to consider not only the expected magnitude of the main effect of a risk or protective factor but also the improvement in aggression it can be expected to engender through its indirect effects.

Chapter 3: Resilience and Protective Factors

Introduction

The previous chapter provided a discussion of the risk factors leading to the development of aggression, as well as the relation between corporal punishment and aggression. However, it is the case that not everyone who experiences corporal punishment goes on to develop subsequent aggression. Longitudinal studies have led to a better understanding of the characteristics of youths who are at risk of becoming serious and violent offenders (Lösel & Farrington, 2012). Less research has focused on those who abstain from violence, as well as protective factors within samples who have experienced corporal punishment (Hall, Simon, Mercy, et al., 2012; Holmes, Yoon, Voith, Kobulsky, & Steigerwald, 2015; Lösel & Farrington, 2012). Most research has examined protective factors in maltreated versus non-maltreated children (Holmes et al., 2015) or in other high risk populations. Few studies have considered protective factors between corporal punishment and subsequent aggression across time points in a longitudinal study that measured both experiences of corporal punishment and subsequent aggression concurrently. This study seeks to address this gap in the literature and examine the effects of individual dispositional and environmental protective factors on aggression in relation to corporal punishment. Before empirically testing protective factors between corporal punishment and aggression in later chapters, this chapter provides a conceptual framework for the study of protective factors. First, a brief discussion of resilience is provided. Second, terminological, conceptual and methodological issues of examining protective factors are addressed. Finally, a review is provided of current research on protective factors, with special consideration of developmental periods, severity of risk, and types of risks experienced.

Resilience

The concept of resilience comes from the notion that not everyone who is faced with a risk factor has the same negative outcome. Some individuals are able to develop relatively positive outcomes despite being exposed to risks and adversities. There is large heterogeneity in people's responses to adversities (Rutter, 2012). Resilience is an interactive concept (Rutter, 2013) and can be defined as 'a reduced vulnerability to environmental risk experiences, the overcoming of a stress or adversity, or a relatively good outcome despite risk experiences' (Rutter, 2012; Rutter, Moffitt, & Caspi, 2006). The study of resilience is said to have been pioneered by Norm Garmezy from the early 1970s (Garmezy, 1974; 1985 cited in Rutter, 2012). He was interested in the various experiences of other individuals and developing ways to help children who are exposed

to stress and adversity. Garmezy believed that resilience was not to be viewed as a fixed attribute of an individual, but instead it should be viewed as a process (Rutter, 2012). This is because resilience to certain risks could not be assumed to be protective in relation to all risks (Rutter, 2012). The study of resilience has also been developed within child and family social work research (Fitzpatrick, 2011). Gilligan (2001 cited in Fitzpatrick, 2011) focused on resilience of children in care. Gilligan (2001 cited in Fitzpatrick, 2011) is considered a pioneer in this area of resilience research and has influenced the work of practitioners working with young people in the care system (Fitzpatrick, 2011). More contemporary research on the concept of resilience has increased in the last two decades as researchers have started to emphasize positive adaptations rather than negative ones. Resilience research has its origins in the 'universal finding from all research, naturalistic and experimental, human and other animals, that there is huge heterogeneity in response to all manners of environmental hazards: physical and psychological' (Rutter, 1992, p. 336). Resilience research not only wanted to highlight different responses to various adversities, but also to increase knowledge of causal processes.

Protective Factors

Within developmental and life course criminology, there has been an increased focus on identifying reasons why some individuals do not develop problem behaviour after being exposed to known risk factors. This has led to the increase in research examining protective factors. Many different definitions and domains of protective factors have been identified in the process of studying resilience (Jolliffe, Farrington, Loeber, & Pardini, 2016). Moreover, this area of research has also been influenced by previous research that examined factors associated with desirable outcomes amongst children who are otherwise considered at risk (e.g. poverty, low maternal education, disrupted family, perinatal stress) (Werner & Smith, 1992). The study of protective factors is also influenced by prevention research which has seen an increase since the 1990s. Some argue that the study of protective factors was imported into criminology from public health (e.g. research to tackle illnesses such as cancer and heart disease) (Farrington et al., 2016).

Within Criminology, the goal was to identify key risk factors for offending and then implement methods designed to counteract them. More recently, empirical research that has advanced the discussion of protective factors has essentially been presented in two phases. The first phase was one of the first coordinated efforts to understand the role of protective factors in the development of violence and aggression which came from a Centre for Disease Control (CDC) initiative (Hall, Simon, Mercy, et al., 2012). An expert panel examined the direct protective and

risk effects of factors that predicted the likelihood of violence (Lösel & Farrington, 2012). The panel was convened to review and advance the status of etiologic and prevention research on direct protective and buffering protective factors (definitions provided below) for youth violence (Hall, Simon, Mercy, et al., 2012). The main objectives of the panel were to address gaps in the understanding of protective factors by clarifying definitional and analytic issues and review the state of evidence regarding the factors that are labelled as direct protective, buffering protective or both. Furthermore, the panel sought to carry out new analyses of major longitudinal surveys of youth to acquire new knowledge about protective factors and to highlight implications of this research (Hall, Simon, Mercy, et al., 2012). The second phase in the advancement of empirical studies and knowledge on protective factors was more concerned with identifying interactive or buffering protective factors (Ttofi, Farrington, Piquero, & DeLisi, 2016). Before discussing recent empirical research, clarification of terminology is provided below.

Definitions of Protective Factors

Whereas the definition of risk factors is relatively straight forward, there was less clarity when defining protective factors. Risk factors can be defined as 'personal or social characteristics of an individual that predict a high probability of a future behaviour problem such as the onset, persistence, or aggravation of youth violence' (Lösel & Farrington, 2012). Protective factors can be thought of as a factor that promotes resilience among those exposed to risk factors, such as corporal punishment. This allows for some children, who have been exposed to corporal punishment, to achieve normative levels of aggression despite being exposed to the risk factor. Defining protective factors has been ambiguous in the literature. Some consider a protective factor to be a variable that sits at the opposite end of the spectrum from a risk factor. For example, Loeber et al. (2008 cited in Ttofi, Farrington, Piquero, Lösel, et al., 2016) termed 'promotive factors' as factors that predicted a low probability of offending. This could lead to the argument that a promotive factor is simply the mirror image of a risk factor, making variables termed 'promotive factors' or 'risk factors' misleading. Others define a protective factor as a variable that interacts with a risk factor to reduce its main effects (Rutter, 1985).

There are various types of protective factors, including direct protective factors, risk-based protective factors, and interactive/buffering protective factors. The first type of protective factor is a *direct protective factor* which is defined as a factor 'that predicts a low probability of offending' (Ttofi, Farrington, Piquero, & DeLisi, 2016). A direct protective factor refers to the main effect of a variable and predicts a low probability of future problem behaviour without taking other factors

into account (Lösel & Farrington, 2012). Another type of protective factor is a *'risk-based' protective factor*. This is defined as 'one that predicts a low probability of offending among a risk category' (Ttofi, Farrington, Piquero, & DeLisi, 2016). The third category of protective factor, which is most relevant to the purposes of this study, is the *interactive protective factor* (also known as a buffering protective factor). This is defined as a factor that predicts a low probability of problem behaviour among a group of individuals exposed to a specific risk factor (Andershed, Gibson, & Andershed, 2016; Lösel & Farrington, 2012; Ttofi, Farrington, Piquero, & DeLisi, 2016). An interactive protective factor is one that moderates or attenuates the impact of a specific risk (Lösel & Farrington, 2012). Furthermore, an interactive protective factor differs from a 'risk-based protective factor' as a risk-based protective factor refers to a variable that predicts a low probability of offending amongst a defined group 'at risk', rather than focusing on the interaction with a specific risk factor (Jolliffe et al., 2016). Ttofi, Farrington, Piquero, Lösel, et al. (2016) argue that an interactive protective factor is present when 'the probability of offending does not increase in the presence of the risk factor; when the protective factor is absent, the probability of offending does increase in the presence of the risk factor'. For the purpose of the current study, the term 'interactive protective factor' will be used to refer to a variable that acts as a moderator and predicts lower levels of aggression when coupled with the risk factor, corporal punishment.

Domains of Protective Factors

A number of different domains of protective factors have been identified in various empirical studies (e.g. family, peer group, neighbourhood, school, individual) (e.g Hall, Simon, Lee, & Mercy, 2012; Howell & Miller-Graff, 2014; Lösel & Farrington, 2012; Ttofi, Farrington, & Lösel, 2012). Various protective factors at the individual and family level that may buffer the risk of undesirable behaviours have been acknowledged (see Afifi & MacMillan, 2011). For example, protective factors that may promote resilience in children who have experienced corporal punishment include prosocial skills such as self-regulation and positive attachment to others (Holmes et al., 2015). At the individual level, possessing prosocial skills (e.g. self-control, cooperation, assertion, and responsibility) has been identified as a protective factor associated with resilience in externalizing behaviour problems (Holmes et al., 2015). Lösel & Farrington (2012) have provided a detailed overview of the specific domains of protective factors and corresponding research. The following is a general discussion of their findings, focusing only on domains relevant to this study such as individual, family and school.

Individual Protective Factors

When discussing protective factors, it is important to take into consideration the fact that individuals respond to adversity in different ways, and a protective factor for one person may not be significant for someone else. It is also important to consider different developmental periods and the severity of risk when testing protective factors. Nevertheless, the following is a discussion of possible individual protective factors that warrant further attention.

Intelligence. High intelligence has been found to have a direct protective function against problem behaviours (Lösel & Farrington, 2012; Ttofi, Farrington, Piquero, Lösel, et al., 2016). Furthermore, high intelligence has also been found to act as an interactive protective factor in the presence of risks such as a criminal father or previous antisocial behaviour (Lösel & Farrington, 2012). When examining intelligence as an individual protective factor, it is recommended that differing effects are tested for males and females separately. For example, some studies have found that high intelligence acts as an interactive protective factor for males but not females (Elder, Caspi, & van Nguyen, 1986). It may be the case that the protective capabilities of high intelligence are related to executive neuropsychological functioning, such as self-control or social information processing (Lösel & Farrington, 2012). Studies suggest that high intelligence is not necessarily an indication of intellectual capacity, but instead a reflection of more 'practical intelligence, social competence and realistic planning that protect against antisocial development in the presence of risk' (Lösel & Farrington, 2012). Although measures of high intelligence might overlap with other factors that have protective capabilities, it is still considered to be a protective factor worth investigating further.

Social Cognitions. As discussed in Chapter 2, Social Information Processing theory suggests that social cognitions and interpretation of situational cues are important risk factors for problem behaviour. This perspective could also be applied when examining protective factors. For example, previous studies have found that positive attitudes towards the family and school, and perceived risk of being caught resulted in less problem behaviour in adolescence (Moffitt et al., 1996). This relates to the perspectives presented in the Life-Course Theory by Moffitt et al. (1993; 1996). For example, Moffitt et al. (1996) found that those who perceived the risk of detention at higher levels were more likely to abstain or desist from offending when compared to those who showed adolescent limited or persistent antisociality which is discussed in more detail below.

Temperament. Low levels of impulsivity, hyperactivity and low self-control have been found to predict desirable development (Lösel & Farrington, 2012). In the Dunedin study (Moffitt et al., 1996), children who were identified as low in emotional instability, having restlessness and attention problems were also those who abstained from problem behaviours. Those who were on a more life-course persistant antisocial pathway and more likely to develop violent behaviour problems were identified to have more difficult temperament in childhood than those with adolescent-limited antisociality (Moffitt et al., 1996; Lösel & Farrington, 2012).

Biological Factors. Various biological factors have been tested as potential protective factors such as genetic factors (e.g. genetic MAO-A activity) and autonomic arousal (e.g. higher heart rate level, higher skin conductance arousal, and better skin conductance conditioning). For example, as discussed below, Caspi et al. (2002) assert that the key to explaining those who display persistent problem behaviours over the life course is by exploring the combination of early major childhood trauma and a genetic variation associated with the production of the enzyme, MAO-A. Caspi et al. (2002) found a linear relation between the intensity of child maltreatment in the family and later antisocial behaviour of children (Lösel & Farrington, 2012). However, when comparing children with high vs low genetic MAO-A activity, their analysis showed those with high genetic MAO-A activity had less negative outcomes of severe maltreatment. Autonomic arousal is also a biological candidate for protective factors. As discussed above, previous research has found that skin conductance reactivity (SCLR) moderated the assocation between harsh parenting and the development of externalizing behaviour (Eisner & Malti, 2015). However, it has also been found that a higher heart rate level, higher skin conductance arousal and better skin conductance conditioning predicted desistance from aggressive behaviour (Lösel & Farrington, 2012).

Family Factors

When examining potential protective factors in the family domain, it is important to recognise the possible bidirectional relation. For example, family factors may have an impact on the child, while at the same time, the externalized behaviour of the child might also have an impact on the family. According to Lösel and Farrington (2012) ‘an emotionally positive parent-child relationship and secure bonding is a basic direct protective factor in child development and has buffering protective effects in preventing a broad range of behaviour problems in the presence of risk factors’. A close relationship with parents promotes nonviolence and encourages social learning in a structured social environment (Lösel & Farrington, 2012). Furthermore, research suggests that having an

emotionally warm, attentive and structured upbringing encourages the positive development of children and can act as interactive protective factors against risks for antisocial development. Moreover, research has found that 'intensive supervision, high persistence of discipline, low physical punishment, and strong involvement of the child in the family's activities had mainly direct protective effects' and improved the behaviour of children with conduct problems (Lösel & Farrington, 2012).

School Factors

Various school factors have been identified as protective factors such as: high academic achievement, school bonding, school rewards and academic aspirations (Jolliffe et al., 2016; Kim et al., 2016; Lösel & Farrington, 2012; Ttofi, Farrington, Piquero, & DeLisi, 2016). High intelligence has also been found to be a protective factor (Ttofi, Farrington, Piquero, Lösel, et al., 2016) and could be seen to have an overlap with the above protective school factors. However, previous studies have found that for children from high-risk backgrounds, school achievement and a strong bond to the school was more relevant to successful adjustment than was high intelligence (Lösel & Farrington, 2012). Academic achievement and school bonds could have causal links with prosocial behaviour due to the fact that they may indicate strong bonding to society or motivation for future job stability (Lösel & Farrington, 2012).

The Difference between Protective Factors and Resilience

According to Masten and Powell (2003 cited in Rutter, 2012), promotive factors generally operate in the same way across all populations and resilience is best promoted by focusing on competence. These promotive factors include: cognitive abilities, temperament, parenting quality and good schools. While these *are* examples of promotive factors, Rutter (2012) argues they did not focus on promotive factors or influences that are generalizable in the presence of adversity, which is what defines resilience. According to Rutter (2006), resilience differs from protective factors. This is because resilience starts by recognising individual variation in people's responses to the same experiences, and 'considers outcomes with the assumption that an understanding of the mechanisms underlying that variation will cast light on the causal processes and, by so doing, will have implications for intervention strategies with respect to both prevention and treatment' (Rutter, 2006). By contrast, protective factors start with a focus on variables and then move to outcomes. Protective factors have an implicit assumption that 'the impact of risk and protective factors will be broadly similar in everyone, and that outcomes will depend on the mix and balance between risk and protective influences' (Rutter, 2006). However, although it is different, resilience

research requires the study of risk and protective factors as it is an interactive concept (Rutter, 2006).

Theoretical Considerations

As discussed above, the main objective in identifying protective factors is to ascertain why some individuals abstain or desist from antisocial behaviours when exposed to risk. In addition to considering elements of desistance, the study of protective factors also needs to consider the impact of different developmental periods, severity of risk and separate categories of risk. Protective factors could be different for the onset of or desistance from violence (Lösel & Farrington, 2012). Although an early onset is most relevant for serious and persistent antisocial behaviour, which will be discussed further below, there are other pathways such as late starters or early desisters (Lösel & Farrington, 2012). Studies have suggested that protective factors should be discussed in relation to life-course theories and developmental theories (Dubow et al., 2016; Farrington et al., 2016; Jolliffe et al., 2016; Lösel & Farrington, 2012). Before examining these concepts within recent empirical research, a brief theoretical discussion is provided in relation to life-course and developmental theories.

Life-course theory is a theory that attempts to explain antisocial behaviour based on the young person's stage of development and age of onset. The main objectives within a range of developmental and life-course theories are quite similar: to examine the effect of early childhood experience and antisocial behaviour and its impact on adult offending. There are several different theoretical approaches to explaining the onset and desistance of problem behaviour over the life-course. Moffitt's (1993) typology-based view focuses on the age of onset and separates antisocial adolescents into separate categories of risk such as life-course persistent (LCP) and adolescent-limited (AL). According to Moffitt (1993), LCP delinquents are those who began their antisocial behaviour in childhood and continued it for many years thereafter, into late adulthood. Conversely, AL delinquents are those who began their antisocial behaviour within their adolescent years and desisted in young adulthood. More specifically, Moffitt (1993) hypothesized that early childhood antisocial behaviour such as difficult temperament, hyperactive behaviour and other cognitive deficits would increase the chances of serious antisocial behaviour later in adult life. Additionally, LCP offenders are characterized by high risk social environments including poor parenting, poverty, and poor family bonds.

Moffitt's (1993) typologies of AL and LCP offenders is relevant to the study of protective factors as it illustrates that the age of onset, or developmental period that antisocial behaviour

commences, is indicative of the severity of problem behaviour in the future. It also supports the notion that different severities of risk can have differing impacts on outcome behaviours, and when studying protective factors it is important to take this into consideration (as will be discussed below). Caspi, McClay, Moffitt et al. (2002) also highlight the importance of considering biological factors and cumulative risk factors when examining high risk groups such as the LCP group. As mentioned above, Caspi, McClay, Moffitt et al. (2002) assert that the key to explaining the LCP trajectory is by considering the combination of early major childhood trauma and a genetic variation associated with the production of the enzyme, Monoamine oxidase A (MAO-A). In brief, this enzyme affects the production of serotonin, which assists in mediating aggressive and violent impulses. Caspi et al. (2002) explain further that the interaction of these two factors is related to the frontal lobe cortex of the brain which causes deficits in executive brain functions. More specifically, this affects the ability to plan, to control impulses and often, antisocial behaviours.

With regards to AL delinquents, Moffitt (1993) asserts that their antisocial behaviour is initiated approximately with puberty or adolescence and ends in young adulthood. It is argued that AL delinquents begin their antisocial behaviour due to a strain caused by a 'maturity gap' (Moffitt, 1993). The concept of a 'maturity gap' is defined by the differences in physical development/maturity and emotional maturity where the adolescent seeks to engage in adult behaviour yet is not allowed to because of legal age restrictions. The frustration or strain caused by these prohibitions cause AL delinquents to often engage in antisocial behaviours to release their frustrations. As the adolescent enters late adolescence, they are given more responsibility and more privileges which reduce the strain or the 'maturity gap' and promote desistance from antisocial behaviours. This is relevant to the discussion of protective factors as it highlights the importance of considering factors that are unique to specific developmental periods when testing for direct or interactive protective effects. Furthermore, Moffitt (1993) suggests that AL offenders are less likely to continue a delinquent trajectory if there are strong pre-delinquent family bonds and positive socialisation. This is indicative of a potential protective effect of family bonds and socialisation which has been identified in empirical research as a protective factor (Dubow et al., 2016; Fontaine et al., 2016; Kim et al., 2016).

In addition to considering protective factors based on developmental periods and risk groups, it is also important to consider the impact of specific risk categories. For example, with regards to life-course theory, Moffitt (1993) reported that the LCP trajectory is differentially associated in males who have weak bonds to the family, early school leaving and personality traits including

alienation, impulsivity and callousness. Conversely, the AL trajectory is differentially associated with delinquent peers. As research on protective factors continues to develop and inform prevention and intervention initiatives, it is important to consider the significance of different risk categories on subsequent antisocial behaviour, but also the overlap with developmental periods. If different risk typologies, such as LCP and AL offenders, have unique 'risk effects', then intervention programs need to be tailored in a way that meets the specific needs of the group it is addressing. It would not be an efficient use of resources if intervention programmes focused on strengthening family bonds with AL offenders and not LCP offenders, given previous research (Moffitt, 1993) has found it is LCP offenders who are more likely to be exposed to this risk factor.

As discussed, in addition to focusing on risk groups and risk categories, it is important to also consider stages of development when examining potential protective factors and intervention programmes. Thornberry and Krohn (2005) propose that instead of dividing offenders into two groups based on their age of onset, delinquent behaviour can begin at any age and they examine the initiation of offending based on four different stages of development: preschool, childhood, adolescence and late adolescence/early adulthood. Thornberry and Krohn (2005) assert that there was only a small portion of their population that initiated antisocial behaviour in toddlerhood and childhood; however, those who did were more likely to persist in delinquency over a longer period of time. Individuals who displayed antisocial behaviour in the early developmental stages had more problems with regards to temperament, aggression, impulsivity and negative emotionality in life. This is relevant to the study of protective factors as it highlights the importance of testing protective factors that are most relevant to the developmental period being protected against, as well as considering the effect on unique outcome behaviours.

Empirical Recommendations: Examining Protective Factors

The empirical testing of protective factors varies, and critical appraisals of the resilience literature raise concerns about the ambiguities in the definitions and terminology used across studies (Ttofi, Farrington, Piquero, Lösel, et al., 2016). More complicated conceptual and methodological issues in studying protective factors has resulted in there being less well-replicated results (Ttofi, Farrington, Piquero, Lösel, et al., 2016). There are many different empirical considerations and methodological recommendations with regards to the study of protective factors, all of which can be traced back to the chosen application of the definition of protective factors for that study. However, according to Garmezy (Rutter, 2012), regardless of the chosen definition of protective factors in the study, the study of resilience requires a methodologically rigorous approach to data

analysis. Furthermore, research on resilience requires longitudinal data and must consider multifactorial causal pathways as well as an examination of gene-environment interdependence (Rutter, 2012). According to Hall, Simon, Mercy, et al. (2012), to empirically test protective factors, longitudinal studies are needed which measure potential direct protective factors that might predict nonviolence at a later period in time.

When conducting research on protective factors and resilience, it is important to keep in mind that resilience differs from both social competence and positive mental health (Rutter, 2006). Moreover, examining the concept of 'positive behavioural outcomes' has highlighted a few methodological problems. More specifically, desirable outcomes such as psychological and social competence raise a different set of issues (Rutter, 2012). Rutter (2012) identifies three main limitations; the first is the implication that casual influences will be the same in non-stressed groups compared with those experiencing adversity. The second limitation to consider is the implication that protective factors can be identified on the basis of their nature, rather than their effects. While this may be the case in some situations, research must take into consideration the fact that protection from adversity could be the result of risk experiences that lead to successful coping. That is to say, in some situations you may find that the same 'protective factor' does protect against adversity; but for others, the degree of protection may depend on previous exposures to risk and that specific exposure to risk leading to more successful coping skills. The experience of adversity may actually strengthen resistance to later stress (Rutter, 2006). Finally, the third limitation identified by Rutter (2012) is the assumption that most individuals will respond to adversity in similar ways and to the same degree, and that prevention will be achieved by acting on that assumption. It is important that prevention measures are implemented in a way that recognises that not all individuals will respond to adversity in the same way and that more individualised interventions are researched and developed.

As discussed above, there are some concerns with identifying a protective or promotive factor as the 'opposite end of the spectrum' to a risk factor. The concern is that by doing this, classifying a variable as a risk or promotive factor is misleading (Ttofi, Farrington, Piquero, Lösel, et al., 2016). However, according to Ttofi, Farrington, Piquero, Lösel, et al. (2016), it depends on whether the variable is linearly or nonlinearly related to offending. One methodological approach to examining this is by trichotomizing variables into the 'worst' quarter (e.g. increased low self-control), the middle half, and the 'best' quarter (e.g. decreased low self-control) and then comparing both the risk end and the promotive end of the same variable (Jolliffe et al., 2016). A variable would be

considered both a risk and protective factor it if was linearly related to the outcome (i.e. aggression). For example, if the percent of aggression is low in the best quarter and high in the worst quarter then that variable would be considered both a risk and protective factor (Ttofi, Farrington, Piquero, Lösel, et al., 2016). However, a variable would be considered a promotive factor if the percent of aggression is low in the best quarter but not high in the worst quarter. It is acknowledged that trichotomizing protective factors is only one of many ways to test protective factors. However, it is important that when examining protective factors, previous levels of the outcome variable are accounted for. For example, if one was to test the impact of corporal punishment on subsequent aggression at a later time point, previous levels of aggression would need to be accounted for in order to isolate the impact of the risk variable and to ascertain if the interactive protective factor had a significant effect. This can be accomplished by conducting an autoregressive cross-lagged panel model (Adachi & Willoughby, 2015) with longitudinal data. Interactive protective factors can be tested by multiplying the risk factor and the protective factor together to create a product term. This product term can then be tested for significance against the outcome variable as a means to determine whether there is an interactive effect and, ultimately, whether that variable is an interactive protective factor.

Some argue that, in longitudinal studies, the protective factor needs to be present before or at the same time as the risk factor, but always before the outcome variable (Ttofi, Farrington, Piquero, & DeLisi, 2016). It could also be argued that in order to address issue regarding temporal order, the protective factor should come after the risk factor, but still before the outcome variable. The benefit of conducting an autoregressive cross-lagged panel model is that it is possible to test a protective factor that is present both at the same time and after the risk factor. There are some limitations to this approach in that having regressions within timepoints between a risk factor and a protective factor, at the same time as testing for lagged effects, can impact levels of significance on the outcome variable. Careful consideration is required when interpreting results. However, the autoregressive cross-lagged panel model still remains to be a desirable approach when testing interactive protective factors as it allows the researcher to account for previous levels of the outcome variable. This is beneficial because, according to Collins, Maccoby, Steinberg, Hetherington, and Bornstein (2000), one way to establish the causal direction between parenting and the impact on subsequent behavioural outcomes is to control for the young person's prior behaviour problems.

Empirical Studies Examining Protective Factors

Identifying protective factors that have both direct and interactive effects is important with regards to informing the development of preventative measures for use among youth whose risk of becoming violent is greater than average (Hall, Simon, Mercy, et al., 2012). At the individual level, possessing prosocial skills (e.g. self-control, cooperation, assertion, and responsibility) has been identified as a protective factor associated with resilience in externalizing behaviour problems (Holmes et al., 2015). For example, Holmes et al. (2015) examined children between the ages of four and 10 who had been investigated for maltreatment by child protective services to study early risk and protective factors. They used data from the National Survey of Child and Adolescent Well-Being. In their study, children who were physically abused were 1.5 times more likely to exhibit clinical levels of aggression than children who were not abused. However, they found that children's prosocial behaviour decreased the likelihood of exhibiting clinical levels of aggressive behaviour at the time of physical abuse taking place, as well as time 2 which was 18 months later.

In addition to prosocial behaviour being identified as a protective factor, other studies have found positive teacher-child relationships and high self-control to be protective factors**.** Previous research has found that having a positive attachment with another adult outside of the family can have similar benefits found with positive parent-child attachment (promotes nonviolence and encourages social learning in a structured social environment) (Lösel & Farrington, 2012). For example, Vassallo, Edwards, and Forrest (2016) investigated the relation between various protective factors and subsequent involvement in physical fighting, using data from the Australian Temperament Project. Within their longitudinal study, they focused on children who were classified as at-risk for high levels of externalizing problem behaviours at age 12. They investigated both risk-based protective factors and interactive protective factors that could reduce the involvement of those with externalized problem behaviours in physical fighting six to eight years later. Vassallo et al. (2016) examined a comprehensive list of factors, including individual traits and attributes (e.g. empathy, self-regulation, and religiosity); attitudes (school attachment and importance of education); social and working relationships (e.g. supportive peer relationships and relationships with teachers); indicators in the family environment (e.g. parental warmth and parental monitoring) and community involvement (e.g. social capital, civic engagement). They found that risk-based protective factors, such as high levels of self-regulation, personal responsibility, having a good relationship with their teachers and warm and supportive relationships with their parents were negatively associated with fighting. With regards to self-control, Vassallo et al. (2016) found that high levels of self-regulation at ages 11-12 protected at-

risk children from involvement in violence at ages 17-18 and at 19-20. Moreover, positive teacher-child relationships at the age of 15-16 were found to be a protective factor against violence at ages 17-18 and at 19-20. When factors such as supportive relationships with peers, positive relationships with teachers, and high levels of parental monitoring were absent, child aggression was associated with increased involvement in violence. When they were present, the effects of externalizing problems were negligible (Vassallo et al., 2016), which indicates that these are to be considered interactive protective factors as defined above.

Intelligence and academic achievement have increasingly been examined as protective factors in recent research (Ttofi, Farrington, Piquero, & DeLisi, 2016; Jolliffe et al., 2016). For example, Ttofi, Farrington, Piquero, Lösel, et al. (2016) conducted a meta-analysis on current evidence that examined the protective effect of intelligence against criminal, delinquent, violent and other forms of antisocial behaviour. Their objective was to examine the extent to which intelligence may explain resilience against adversities differentially for high-risk and low-risk individuals. Their meta-analysis included data from prospective longitudinal studies because, they argue, a protective factor should operate before or at the same time as a risk factor and before the outcome. There were fifteen studies included in their meta-analysis, all of which investigated above-average intelligence as a potential protective factor against offending. Their results supported the interactive protective effects of intelligence against offending within both low-risk and high-risk groups which suggests that intelligence does act as an interactive protective factor.

In addition to studies that identify high intelligence to be an interactive protective factor, other studies have also found that high academic achievement acts as an interactive protective factor. For example, Jolliffe et al. (2016) used data from the Pittsburgh Youth study to explore risk-based and interactive protective factors for those from deprived neighbourhoods, those living in deprived families and those who have repeated a grade. Longitudinal data was used as a means to examine the extent to which variables measured at ages 10-12 predicted violence between the ages of 13-19. To do this, variables from across different domains (individual, family, school, peer and community) were trichotomized into the worst quarter, the middle half and the best quarter. Their study found that high academic achievement was an interactive protective factor and consistently related to low levels of violence. In addition to interactive protective factors, Jolliffe et al. (2016) also found various risk-based protective factors. For example, they found risk-based protective factors across various domains such as individual (e.g. low hyperactivity, low psychopathic features) family (good supervision, low parental stress), school (high academic

achievement, positive attitude to school) and demographic characteristics (older mother, good quality housing).

It may be the case that specific protective factors at different developmental periods have diverse main effects depending on the level of risk that is present. For example, Dubow, Huesmann, Boxer, and Smith (2016) examined childhood (age 8) and adolescent (age 19) risk (aggression and low family socioeconomic status) and protective factors (individual and family variables) for adulthood violence. Their objective was to explore whether protective factors at the same developmental periods (childhood and adolescence) had direct or 'risk-buffering' effects on adult violence. They used data from the Columbia County Longitudinal study which is a prospective study of a community sample of males followed from ages 8 to 48. Their research design included interviews taking place at four developmental periods: childhood, late adolescence, early adulthood and middle adulthood. When looking at the independent effects of age 8 protective factors, they found that having parents who attend church more often and having experienced fewer negative family interactions reduced the risk of violence during adulthood. With regards to age 19 protective factors, they reported that higher educational aspirations and aggression anxiety independently reduced the risk of violence in adulthood.

In addition to examining independent effects of protective factors, they also investigated cumulative childhood and adolescent protective factors on adulthood violent offending. To create a 'cumulative protective factor', Dubow et al. (2016) summed the dichotomized protective factors separately for each time point (four variables in childhood, three in adolescence). Following that, they trichotomized the sum of the protective factors at ages 8 and 19 into groups of participants with zero, one and two or more protective factors. After administering forward stepwise logistic regression, they found that the chances of becoming a violent adult did not change significantly as the number of age 8 protective factors increased for at-risk males. However, when considering the group of males with no risk factors, the chances of becoming a violent adult decreased substantially as the number of age 8 protective factors increased. In contrast, age 19 protective factors were found to significantly reduce the chances of 'at risk' males becoming violent adults; however, there was no effect for non 'at-risk' males. Furthermore, Dubow et al. (2016) examined which specific protective factors played a protective role against subsequent adult violence. Their findings indicate that none of the specific age 8 protective factors decreased the chances of becoming a violent adult for those males with at least one risk factor. However, high age 8 aggression anxiety and age 8 popularity acted as a protective factor for boys with no risk factors,

but not for boys with at least one risk factor. With regards to age 19 protective factors, high aggression anxiety and high educational aspirations reduced the chances of becoming a violent adult for youth with at least one risk factor, but there were no protective factors found that decreased the chances of becoming a violent adult among youth with no risk factors. Findings from their study suggest that, with regards to cumulative protective factors, the sum of adolescent protective factors serves as a 'buffer' against the negative effects of risks; however, childhood protective factors are not protective in the presence of risk with regards to subsequent adult violence.

Farrington et al. (2016) investigate the extent to which variables measured at age 8 – 10 predicted convictions between ages 10 and 18 using data collected in the Cambridge Study in Delinquent Development (CSDD). The CSDD is a prospective longitudinal survey of 411 South London males (see Farrington et al., 2006). All age 8-10 variables were trichotomized into the worst quarter, the middle half, and the best quarter. Variables were classified as a risk factor, a promotive factor or mixed (linearly related to offending). The promotive odds ratio (OR) compares the promotive 'best' category with the remainder, while the risk OR compares the risk 'worst' category with the remainder. Risk-based protective factors were examined among their group classified as the most troublesome (158 boys, 47% were convicted) and compared with the remaining 251 boys (14% convicted). Risk-based protective factors were identified amongst seven variables (supervision, daring, job of mother, neuroticism, number of friends, verbal intelligence, nervousness). Each variable was associated with a decrease in the percent of troublesome boys convicted, of at least 10%, and because all ORs were substantial, the above seven variables were considered to be risk-based protective factors (Farrington et al., 2016).

Protective factors may have a different effect on outcome behaviours depending on the developmental period of the adolescent which is important to consider when designing prevention or intervention initiatives. For example, family factors might be more influential in early childhood, and peer factors might have a greater effect in adolescence (Kim et al., 2016). Furthermore, many studies on protective factors include factors that are difficult to influence or manipulate (for example, IQ at the individual level or neighbourhood composition at the community level) (Fontaine et al., 2016). However, when considering protective factors from a prevention perspective, it would be beneficial to identify protective factors that were more amendable to change. Risk and protective factors that are 'modifiable' within the domains of the individual, peer group, family, school, and community have been linked to violent behaviour in young people

(Hemphill, Heerde, & Scholes-Balog, 2016) and warrant further exploration. For example, using longitudinal data from the Montreal Longitudinal and Experimental Study, Fontaine et al. (2016) examined three factors they considered to be amendable to change: perceived legitimacy of legal authorities, parental supervision, and school engagement. In addition to those three variables, they also included two cumulative indexes (a pre-adolescence factor index and a mid-adolescence factor index). Their analysis began with the use of latent profile analysis as a means to identify behavioural profiles of their sample. Their second analysis included multiple linear regressions as a means to investigate whether the selected pre- and mid-adolescence factors would act as compensatory factors and/or protective factors against the predictive effect of the behavioural profiles on violent delinquency. A compensatory factor is also known as a direct/risk-based protective factor and has main effects that are opposite to risk factors (Fontaine et al., 2016). They found that the three main variables, perceived legitimacy of legal authorities, parental supervision and school engagement, plus the cumulative factor index in mid-adolescence (ages 14-15 years) had a direct protective effect against violent delinquency in late adolescence (ages 16 – 17 years old). When considering the three main variables and the cumulative factor index for pre-adolescence (ages 11 – 12 years), there was no direct protective effect. When considering youth with low to moderate childhood risks, perceived legitimacy of legal authorities, parental supervision, school engagement and both cumulative factor indexes were found to protect against engaging in high levels of violent delinquency. In the high aggressive-disruptive group, only very high levels of the protective factors (perceived legitimacy of legal authorities, parental supervision and school engagement) had a main effect and counterbalanced the risk of violent delinquency. Implications from their study are important to consider when designing prevention or intervention initiatives.

Fontaine et al. (2016) argue that initiatives should be tailored to the specific developmental period that the young person is in. For example, given that perceived legitimacy of legal authorities, parental supervision and school engagement at age 14-15 (and not at age 11-12) was found to be a protective factor against violent delinquency at age 16-17, prevention initiatives should concentrate their efforts on these protective variables in mid-adolescence rather than pre-adolescence. Furthermore, the degree of risk experienced had an impact on the protective capabilities of these factors, which should also be taken into consideration. Perhaps for adolescents who display a ‘low to moderate’ risk of engaging in violent delinquency, the three protective factors listed above would be worth concentrating on. However, a more individualised intervention would need to be considered for those displaying a high risk of violent delinquency,

as perceived legitimacy of legal authorities, parental supervision and school engagement did not have a protective effect in the high risk-group. This further strengthens the need to continue the investigation into specific protective factors for different developmental and risk categories.

In addition to considering different developmental periods and levels of risk, it is also important to consider protective factors with regards to different 'types' of risk groups and those that are modifiable. For example, Hemphill et al. (2016) examined risk-based and interactive protective factors measured in grade five and grade nine for violent offending in grade 11 and young adulthood (18-19 years). They used longitudinal data from the International Development study of antisocial and prosocial behaviours among adolescents in Victoria, Australia. Separate analyses were conducted on three different at-risk groups for violent offending: drug users, participants from low SES families, and participants who reported high levels of antisocial behaviour in grade nine. Partially adjusted logistic regression analyses were performed to examine associations between risk factors and risk-based protective factors at grade five and nine and engagement in violent offending in grade 11 and young adulthood. Hemphill et al. (2016) report that within their grade five 'drug users' group, moral order was a protective factor for violent offending in young adulthood but not in grade 11. With regards to the grade five 'low SES' group, only religiosity was found to be a protective factor in young adulthood, but not in grade 11. With regards to the grade nine group, recognition of prosocial involvement was found to be a protective factor for the 'drug use' group with regards to violent offending at both grade 11 and in young adulthood. Also, within the 'drug use' group, belief in moral order and high parental attachment were both found to be protective factors in young adulthood, but not in grade 11. As was the case with the previous study, findings presented by Hemphill et al. (2016) also highlight the importance of considering protective factors for different at-risk groups at different developmental stages. As discussed above, the combination of the developmental period and the type of risk (drug use, low SES, high antisocial behaviour) had an impact on whether or not a variable had a protective effect. Thus, in addition to developing prevention and intervention initiatives based on the adolescent's developmental period and degree of risk, it is also important to consider the type of risk being protected against.

Another study that examined protective factors across developmental periods is by Kim, Gilman, Hill, and Hawkins (2016). Using longitudinal data from the Seattle Social Development Project, Kim et al. (2016) examined protective factors in grade 5 (age 10-11) grade 6 (age 11 -12) grade 7 (ages 12-13) and grade 8 (age 13-14), predicting violence in two later periods; grade 7 (ages

12-13), grade 8 (age 13-14) grade 9 (ages 14-15) and grade 12 (age 17-18). Their study set out to examine the extent that protective factors predict reduced violence among different 'risk' groups and whether the effects of protective factors differ by developmental period. To answer these questions, Kim et al. (2016) identified two potential risk groups using measures of high cumulative risk exposure (e.g. across individual, family, school and community domains) and low family SES (e.g. youth from families with high levels of poverty and low parental education). Their results indicate that across the full sample and the two high-risk groups, school rewards in early adolescence and school bonding in middle adolescence reduced the odds of higher levels of violence during late adolescence. This was statistically significant for the low SES group and across the full sample. Moreover, family bonding during early adolescence was found to reduce the odds of violence in late adolescence for all groups. This relationship was statistically significant only for the high cumulative risk group. Finally, family management in middle adolescence significantly reduced the odds of higher levels of violence in late adolescence in the full sample, and among the high-cumulative risk and low socioeconomic groups. When testing protective factors across developmental periods, Kim et al. (2016) found no single protective factor that significantly reduced the odds of violence across all developmental periods. However, they did find (in the full sample) that school rewards in early adolescence significantly reduced the odds of serious violence in both middle and late adolescence. In contrast, school rewards in middle adolescence did not significantly reduce the odds of serious violence in late adolescence. School bonding in early adolescence did not significantly reduce the odds of serious violence in middle and late adolescence. However, school bonding in middle adolescence did significantly reduce the odds of serious violence in late adolescence. These studies highlight the importance of including longitudinal data when examining potential protective factors, as, again, the effect of protective factors may differ depending on the developmental stage of the adolescent, level of risk and type of risk.

Corporal Punishment and Protective Factors

The overall aim of the present study to is investigate the role of interactive protective factors in minimising aggression amongst adolescents who have been exposed to corporal punishment. As discussed above, previous research has suggested that risk factors that contribute to the development of aggression can vary depending on the developmental period of the individual at risk. For example, during pre-school, the family environment may have a greater influence when considering the immediate impact of parental discipline practices. As the presence of the young person's parents in their life is far greater whereas during adolescence, peers may have a stronger

influence due to an increased amount of time away from the home. As discussed in Chapter 2, the child outcomes most often linked with corporal punishment are aggression and antisocial behaviour with many longitudinal studies linking corporal punishment with an increase in subsequent aggression (Berlin, Malone, Ayoub, Ispa, & Fine, 2009; Lansford et al., 2011).

As discussed in Chapter 2, corporal punishment has been found to be linked with increased aggression through various causal mechanisms, such as poor emotional regulation, social and cognitive skills, social information processing, and increased levels of strain and frustration. It has been argued that harsh parenting practices are often associated with poor emotional regulation of the adolescent. Poor emotional regulation is then associated with aggressive behaviour from early childhood onwards (Eisner & Malti, 2015). Various individual-level moderators have been identified which moderate the effects of parenting on externalizing problems (Eisner & Malti, 2015). These include variables such as temperament and emotional regulation (Rubin et al., 2003). In the current study, self-control is tested as an interactive protective factor between corporal punishment and adolescent aggression. Self-control is defined as 'the capacity to stop, override, or alter unwanted responses and behaviours in order to bring them into agreement with standards' (Tangney, Baumeister, & Boone, 2004). Self-control is tested as an interactive protective factor because the higher the level of self-control an individual has, the less likely they are to display problem behaviours (Gottfredson & Hirschi, 1990). This is because higher levels of self-control or self-regulation increase an individual's ability to control emotions and regulate their behaviour (Berger, Kofman, Livneh & Henik, 2007; Bronson, 2000; Barnes, Boutwell, Beaver, & Gibson, 2013). Keatley, Allom, and Mullan (2017) also found that higher levels of self-control were associated with lower tendencies for aggression. With regards to examining self-control as a protective factor, as discussed above, Vassallo et al. (2016) found that high levels of self-regulation at ages 11-12 protected at-risk children from involvement in violence at ages 17-18 and at 19-20.

In addition to testing self-control as an interactive protective factor, this study is also exploring having a positive teacher-child relationship as an interactive protective factor between corporal punishment and aggression. For many years, developmental researchers have focused primarily on parent-child relationships as the main context of children's development (Verschueren & Koomen, 2012). However, supportive adults from outside the family are an important influence on the behavioural, social and emotional development of young people (Oberle, Schonert-Reichl, Guhn, Zumbo, & Hertzman, 2014; Obsuth et al., 2017). The school, like the family, is considered

to be an important socializing institution in preventing antisocial or aggressive behaviour (Sampson & Laub, 1993). Some argue that the school, in comparison with the family, may be better equipped to provide social control (Gottfredson & Hirschi, 1990). Positive Teacher-child relationships have potential protective capabilities. Having a strong teacher-child relationship can provide a context in which children learn interpersonal strategies. For example, youth who have a strong relationship with a teacher might be more likely to talk to them during difficult times. This could help them to develop various coping and interpersonal skills when faced with known risk factors. As discussed above, Vassallo et al. (2016) found positive teacher-child relationships at the age of 15-16 to be a protective factor against violence at ages 17-18 and at 19-20. When factors such as supportive relationships with peers, positive relationships with teachers, and high levels of parental monitoring were absent, child aggression was associated with increased involvement in violence. When they were present, the effects of externalizing problems were negligible (Vassallo et al., 2016) which indicates that positive teacher-child relationships should be considered as an interactive protective factor.

Chapter 4: Methods

The following chapter will introduce the Z-proso study and the methods of data collection for the waves used in this study. This chapter will also elaborate on the scales used in the baseline analyses included in Chapter 5. In the subsequent chapters which discuss specific protective factors, additional variables will be added, which will be explained in further detail within those individual corresponding chapters.

Sample

The analyses are based on data drawn from a combined longitudinal and intervention study, the Zurich Project on the Social Development of Children and Youths (z-proso). This is an experimental, prospective ongoing multi-rater longitudinal study of the development of aggressive and other antisocial behaviours that was set up in a culturally diverse urban context in Europe (e.g. Eisner, Ribeaud, Junger & Meidert, 2008; Ribeaud & Eisner, 2010). The present analysis focused on the longitudinal component of the study. Since the variables included in the current study were not affected in ways thought relevant for the current study, it was legitimate to treat the data as observational (Averdijk, Zirk-Sadowski, Ribeaud, & Eisner, 2016; Malti, Ribeaud, & Eisner, 2011). The sampling frame was formed by all 90 public primary schools in the city of Zurich in 2004 from which a random sample of 56 schools, stratified by school size and school district, was drawn (Ribeaud & Eisner, 2010). The target sample was N=1675 first graders who entered one of the selected public schools in Zurich, Switzerland, at age 7 in 2004. Of all approached parents, 81% (N=1,361) consented to their children's participation at wave 1 (Obsuth, Eisner, Malti, & Ribeaud, 2015). The primary caregiver's country of birth was diverse, with the most common being Switzerland (43%), Serbia-Montenegro (9%), Germany (6%) and Portugal (5%).

The sample also shows considerable variation in socioeconomic status. For example, with regards to education levels, 24% of parents had little or no secondary education, 32% had vocational training, 29% had a baccalaureate degree or advanced vocational diploma and 16% had a university degree. Data has been collected at regular intervals (from parents at ages 7, 8, 9, 10, 11, 13, 15 and 17; from teachers at ages 7, 8, 9, 10, 11, 13 and 15; and from children when they were aged 7, 8, 9, 10, 11, 13, 15 and 17), with the most recent measurement wave completed in 2015. For the current study, data from when the young people were age 11, age 13 and age 15 were used. The selection of these waves of data were made based on theoretical and

methodological grounds. As discussed, it has been proposed that younger children might be less likely to externalise their emotions when having experienced corporal punishment; thus, our youngest age included in this study is age 11 which is considered to be 'pre-adolescence' (Fontaine et al., 2016).

Methodologically, to facilitate the analyses required to explore protective factors, data needed to be available for all three waves included in the analyses. Data from ages 11, 13 and 15 included identical measures and variables, which made these waves of data appropriate candidates for this study. According to Eisner, Murray, Ribeaud, Eisner (in press), with regards to attrition, wave 4 resulted in the lowest participation rate following a request for renewed parental consent. The whole initial target sample was re-contacted in wave 6 which resulted in the highest number of participation. A comprehensive description of the study in terms of recruitment, attrition, measures and sample characteristics can be found in prior publications (e.g. Eisner & Ribeaud, 2007; Ribeaud & Eisner, 2010) and on the study website: http://www.jacobscenter.uzh.ch/de/research/zproso.

Ethics

Following the requirements for ethical conduct in survey-based research with human subjects in Switzerland, outlined by the Association of the Swiss Ethics Committee (2009), informed consent was obtained at the beginning of the study (wave one) from the parents and again from the children at age 13 onwards (Obsuth, Eisner, Malti, & Ribeaud, 2015). Of those parents who were approached, 81% (n=1,361) gave consent for their child to participate at wave one (Age 7) (valid until wave three) and 74% (n=1240) participated in the parent interview at wave one (Age 7). Consent was provided again by parents at wave four (age 11). In wave five (age 13), parents were given the opportunity to refuse their child's participation in the study (passive consent) (Ribeaud & Eisner, 2015).

Measures

All measures were administered in German, which is the official language of the study location: Zurich. Participants were given paper-and-pencil questionnaires to complete in classrooms, which took place in 90-minute sessions. Groups consisted of 5 to 15 participants at a time. Almost all data used in this study is self-reported by participating students who were guided through the questionnaire by two or three trained staff members. As discussed, due to the availability of data

on variables selected for this study, only waves including the ages 11, 13 and 15 were included. At age 11, data was collected during school lessons; however, at age 13, data was collected during leisure time. Because of this, participants at age 13 were given a cash incentive worth US$30 to participate, and at age 15 they received US$50.

The Corporal Punishment Scale

Data on young people's experience of corporal punishment for this thesis was based on self-reported measures. The corporal punishment scales for each wave were mainly based on the Alabama Parenting Questionnaire (Shelton, Frick, & Wootton, 1996) and the Parenting Scale from the Kriminologisches Forschungsinstitut Niedersachsen (KFN), adapted by the z-proso Project Team. Corporal punishment is based on a 3-item scale which asked the young person to respond to specific examples when asked 'when you misbehaved or are disobedient, what do your parents do? Do your parents do the things below never, rarely, sometimes or often?' ($\alpha_{age\ 11}$ = .630; $\alpha_{age\ 13}$ = .699; $\alpha_{age\ 15}$ = .663). Examples of corporal punishment included 'your parents slap you; your parents spank you with their hand'. A mean score of their responses was utilized to create the scale for the current analyses.

The Self-Reported Aggression Scale

Throughout the z-proso study, aggression was measured using the Social Behaviour Questionnaire (SBQ, Tremblay et al., 1991) adapted for adolescents. From age 11, children completed a paper-and-pencil questionnaire. One of the reasons for the reliance on self-reported measures of aggression stems from the fact that as they get older, adolescents have less contact time with their parents due to the increased time spent with their peers and out of the home (Marcus, 2017). This results in parents seeing less of the young person's behaviour with each year of adolescence. The aggressive behavioural outcome measurement includes a total of 9 items. Three items assess reactive aggression (e.g. you reacted in an aggressive manner when teased), three items assess proactive aggression (e.g. you scared other children to get what you want) and three items access physical aggression (e.g. you physically attacked other people). Responses to items were provided on a 5-point Likert scale from *never* to *very often* ($\alpha_{age\ 11}$ = .767; $\alpha_{age\ 13}$ = .835; $\alpha_{age\ 15}$ = .829).

The Combined Teacher-Child Aggression Scale

Data on teacher-reported aggression was also included in this study. Aggression is often considered a negatively valued behaviour and young people are typically aware of this. One of the possible limitations of using self-reported aggression measures is the possibility of response biases resulting in young people providing a more socially desirable response. Issues around response bias and social desirability can be reduced when others are asked to contribute behavioural information about the participant. Thus, in this study, teachers, who often have first-hand knowledge of a participant's aggressive behaviour, were asked to provide information about that individual's behaviour. For the teacher rating of aggression, the SBQ questionnaire was utilised, which was a 55-item paper and pencil questionnaire rated on a 5-point Likert scale from never = 0 to very often = 5. As was the case with the self-reported aggression scale, the teacher reported aggression scale comprised of items referring to physically violent behaviour as well as to proactive and reactive aggression. Questionnaire completion was mandatory for teachers in study schools. Completion time took approximately 2 to 3 minutes per form. Scales obtained from the teacher and the child were z-standardized and averaged across informants to create the combined teacher-child aggression scale.

Gender and Socioeconomic Status

Gender was recorded during the initial interviews with males coded as 1 and females coded as 2. Parent's professions were also recorded during the initial interviews and coded according to Elias and Birch (1994) and transformed into International Socioeconomic Index (ISEI) of occupational status scores ranging from 16 to 90 (Ganzeboom, Graaf, & Treiman, 1992). Final ISEI scores (based on the parent with the highest score) were standardized for further analysis.

Conclusion

The following empirical chapters have been organised based on similar structural formats as a means to allow them to stand as individual studies. Chapter 5 investigates the intergenerational transmission of corporal punishment as well as main effects between corporal punishment and adolescent aggression. Chapter 6 tests self-control as an interactive protective factor and considers the protective effect of self-control based on the level of exposure to corporal punishment, stage of adolescent development and considers gender differences. Chapter 7 follows the same objectives as Chapter 6 and investigates the protective effect of positive teacher-child relationships between corporal punishment and adolescent aggression. Each chapter

includes its own review of relevant literature, an analytic plan and results section. Furthermore, each empirical chapter also includes a discussion section which specifically addresses the findings within that specific chapter. The combined results of the empirical chapters are then discussed further within Chapter 8 with main conclusions and implications presented.

Chapter 5: Baseline Analysis - Corporal Punishment and Adolescent Aggression

Introduction

Previous research has identified a link between exposure to corporal punishment and subsequent aggression in adolescence (Lansford et al., 2011). Moreover, research has found that parents who were exposed to corporal punishment as children are more likely to administer corporal punishment to their own children (Bartlett, Kotake, Fauth, & Easterbrooks, 2017; Muller et al., 1995; Meifang Wang & Xing, 2014). As previously mentioned, some of the proposed reasons for the link between corporal punishment and aggression is that it promotes hostile attributions, models aggression (Bandura, 1977; Gershoff, 2002; Granic & Patterson, 2003) leads to poor emotional regulation and negative social information processing (Weiss et al., 1992). Furthermore, recent empirical studies have established that corporal punishment increases subsequent aggression even when accounting for previous levels of aggression (Altschul et al., 2016). As discussed in Chapter 2, corporal punishment has also been found to result in negative social information processing and increased aggression, which, in turn, can increase the likelihood of administering corporal punishment to the next generation. Thus, the purpose of this chapter is to examine the intergenerational transmission of corporal punishment and to test for main effects between corporal punishment and subsequent aggression in the current sample before testing for interactive protective factors in Chapter 6 and Chapter 7. This baseline analysis is important to complete because in order to be able to test for interactive protective factors between corporal punishment and aggression, it is important to establish whether or not there is a significant relation or main effect to protect against.

The following chapter will provide the baseline analysis, which will include examining the intergenerational transmission of corporal punishment and identifying the relation between corporal punishment and subsequent aggression across the waves of data included in this study. Reference will be made to previous research discussed in Chapter 2 with regards to associations found between corporal punishment and subsequent aggression. The baseline analyses will also include information which highlights experiences of corporal punishment across ages 11, 13 and 15 as well as mean levels of aggression at each time point. Moreover, this chapter investigates gender differences with regards to experiences of corporal punishment across the different age categories. This is important to include, as previous research has found gender differences with regards to the association between corporal punishment and aggression. For example, as

discussed in Chapter 2, Gershoff (2002) argues there may be a stronger association between corporal punishment and aggression for boys, as boys tend to exhibit aggression more than girls and may also elicit more corporal punishment from parents than do girls. Furthermore, previous research has also found that the frequency of spanking is higher for boys than for girls (Straus & Stewart, 1999). It has also been found that girls are less likely to experience corporal punishment than boys (Taylor et al., 2010).

Once descriptive statistics have been examined, I will test for correlations relating to the intergenerational transmission of corporal punishment. I will then examine correlations between corporal punishment and subsequent aggression within and across time points. Finally, regression analyses will be discussed to determine whether or not parental exposure to corporal punishment predicts the administration of corporal punishment and whether corporal punishment at one age significantly predicts levels of aggression both concurrently and across time points.

Upon completion of the preliminary exploratory analyses, an autoregressive cross-lagged panel analysis will be conducted which will examine the predictive power of corporal punishment on subsequent aggression, while controlling for previous levels of aggression. Finally, I will examine the possibility of bidirectional relations between corporal punishment and aggression, relating this back to literature previously discussed in Chapter 2. The main objective of this chapter is to present the baseline data that represent the relation between corporal punishment and aggression which will then be supplemented with further analyses including protective factors in subsequent chapters.

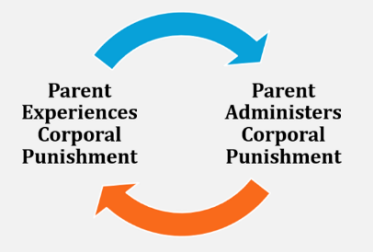
Data Analysis

Within and across time associations between corporal punishment and aggression were assessed using autoregressive cross-lagged panel models estimated in Mplus 8 (Muthen & Muthen, 1998 – 2017). A cross-lagged panel model can be used to examine the longitudinal effects of the levels of one variable on changes in another (Hamaker, Kuiper, & Grasman, 2015). When conducting the autoregressive cross-lagged panel model, aggression measured at age 15 is regressed on aggression at age 13 (*t*-1). Furthermore, aggression at age 13 is regressed on aggression at age 11. The autoregression allows me to capture the stability of aggression over time (Adachi & Willoughby, 2015). The same procedure was completed for measures of corporal punishment. The autoregressive cross-lagged panel model captures effects that suggest how levels in one construct predict changes in another (Adachi & Willoughby, 2015). For example,

whether or not changes in experience of corporal punishment predict changes in levels of aggression. Since the autoregressive cross-lagged panel model controls for past levels of aggression and corporal punishment, this method is more likely to capture causal effects (Adachi & Willoughby, 2015)**.** This method is also beneficial as it enables me to examine any unidirectional vs bidirectional effects between corporal punishment and aggression (Hamaker et al., 2015). Descriptive statistics, correlations and regressions were all run using IBM SPSS version 24.

Intergenerational Transmission of Corporal Punishment Measures

To examine the intergenerational transmission of corporal punishment, I used measures of parental exposure to corporal punishment and parental administration of corporal punishment which were collected concurrently during data collection wave 3 (when children were aged 10).



Parental exposure to corporal punishment was measured by asking parents about their own experiences of corporal punishment from their parents. They were asked to respond to questions about whether or not their mother or father slapped or hit them, on a 4-point Likert scale ranging from ‘strongly disagree’ to ‘strongly agree’ (α= .510). A measure of parent reported administration of corporal punishment was used which asked parents about their own parenting style. Parents were asked three separate questions about whether they spank, slap or hit their child with an object when they have done something wrong. Parents were asked to respond using a 5-point Likert scale from ‘never’ to ‘always’ (Age 10; α= .588).

The Analytic Plan

A more detailed explanation of the analytic plan is included in the following sections. Briefly, I began by examining the intergenerational transmission of corporal punishment from parents to their own children. I did this by examining descriptive statistics, correlations and hierarchical regressions. I then tested the relation between corporal punishment and both concurrent and subsequent aggression. Specifically, this was to 1) assess whether more frequent corporal punishment would predict higher levels of aggression concurrently. I then examined the

hypothesis that 2) corporal punishment would lead to higher levels of aggression across time points and that there would be a lagged main effect. I then examined any bidirectional relations of corporal punishment and aggression to 3) assess if aggression predicted increased corporal punishment. Finally, the above was split by gender to examine if there were any differences in the relation between corporal punishment and aggression for males and females including bidirectional considerations. Analyses were repeated using the combined teacher-child aggression outcome measure and are only briefly considered alongside the main analyses as a sensitivity test.

Descriptive and Inferential Statistics

The first step in the baseline analysis was to examine descriptive statistics and gain an understanding of the intergenerational transmission of corporal punishment, the participants' experiences with corporal punishment and levels of aggression within this study. Additional information regarding sample background characteristics as referred to in Chapter 4. Next, I examined the prevalence rates of corporal punishment and levels of aggression across all age cohorts and then split this by gender. Correlations which examined the association between parental exposure to corporal punishment and self-reported administration of corporal punishment were completed. Following that, correlations between corporal punishment and aggression within time points and across time points were examined, before completing multiple regression analyses.

Hierarchical Regression

Following preliminary correlational analysis, hierarchical multiple regression analyses were employed to determine 1) if there was evidence of an intergenerational transmission of corporal punishment and 2) whether corporal punishment was a significant predictor of subsequent aggression within and across time points. In hierarchical multiple regression analyses, terms are added to the model in a series of steps and the change in the multiple correlation coefficient (*R*) is calculated and tested to determine if the change is significantly different from zero. In other words, at each step, a determination can be made as to whether or not the inclusion of the specific set of independent variables significantly improves prediction of the dependent variable. Further, in each step, standardized beta (β) are calculated and tested in order to determine the relative contribution of each variable to the prediction of the dependent variable. The absolute size, direction and significance level of the β values can be examined to determine the relative

importance of each independent variable in predicting the outcome in each model. A multiple regression which examined the intergenerational transmission of corporal punishment was completed using wave 3 data. Following that analysis, regressions between child exposure to corporal punishment and aggression were administered. When examining adolescent self-reported exposure to corporal punishment, two series of models were tested for each group; one for each aggression outcome variable (self-reported aggression and the combined teacher-child aggression measure). In all regressions relating to child reported exposure to corporal punishment, gender and socioeconomic status were entered into the regression first, due to previous studies linking socioeconomic status to aggression (Dodge, Pettit, & Bates, 1994) and gender to aggression (Archer, 2004). Corporal punishment was added in the second step of the regressions. Following the intergenerational regression analysis, the first group of hierarchical regressions were testing whether age 11 corporal punishment predicted adolescent aggression at ages 11, 13 and 15, while controlling for gender and socioeconomic status. The second group of hierarchical regressions were testing corporal punishment at age 13 as a predictor of aggression at age 13 and 15. The third group of regressions included age 15 corporal punishment as a predictor of age 15 aggression. All regressions within these groups were repeated using the combined teacher-child aggression outcome measure for comparative purposes.

To examine bidirectional relations between corporal punishment and subsequent aggression, hierarchical regressions were repeated while swapping predictor (corporal punishment) and outcome (aggression) variables. The first group of regression analyses examined whether age 11 aggression predicted corporal punishment at ages 11, 13 and 15. The next group of regression analyses included age 13 aggression to determine if it predicted age 13 and 15 corporal punishment. Finally, in the third group of regression analyses, age 15 aggression was entered as the predictor of age 15 corporal punishment. Again, all regressions testing for bidirectional relations were repeated using the combined teacher-child aggression measure.

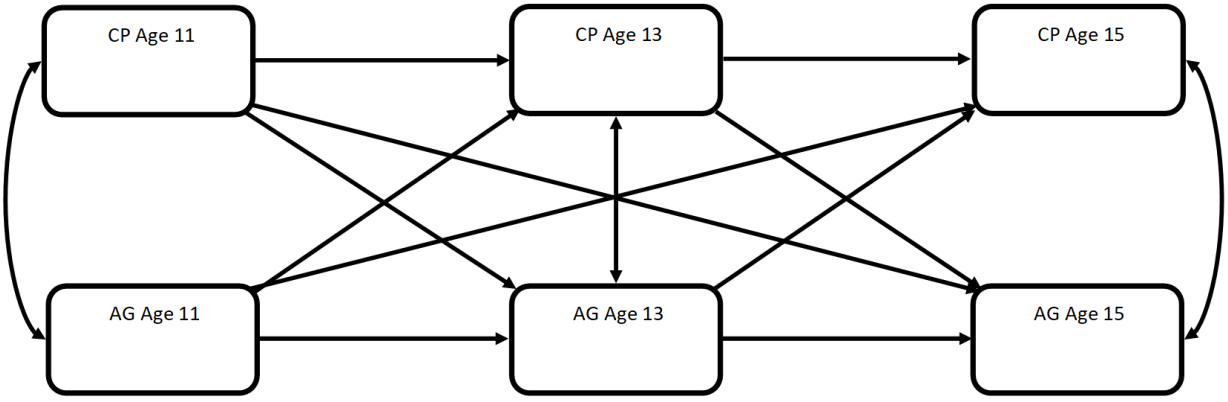
Autoregressive Cross-lagged Panel Model

An autoregressive cross-lagged panel model was conducted which examined the main effects between corporal punishment and aggression within and across time points, while also controlling for stability of aggression (Figure 3). Based on the previous discussions regarding the relation between corporal punishment and aggression, I hypothesised that higher exposure to corporal punishment would increase levels of aggressive behaviour while controlling for previous levels of aggression. In the same model, bidirectional relations between corporal punishment and

aggression were also examined across age cohorts using autoregressive cross-lagged panel analyses. The aim of this analysis was to examine the possible causal ordering of variables. Models were then split by gender as a means to examine the relation between corporal punishment and adolescent aggression separately for males and females while controlling for stability effects. Moderation analyses are not included in the baseline model as these will be discussed in Chapter 6 and Chapter 7.

When testing for main effects between corporal punishment and subsequent aggression, variable scores were based on longitudinal data. Therefore, to account for stability of aggression and corporal punishment, I first completed an autoregression. To account for data missingness and skewness, I utilised maximum likelihood estimation with robust standard errors (MLR) for parameter estimations. Model fit was evaluated using the comparative fit index (CFI), the Tucker-Lewis index (TLI) and the root mean square error of approximation (RMSEA). Good fit was achieved for CFI values >.95 and TLI values >.91 and for RMSEA values <.06 (Bentler, 1990). The chi-square is also reported for all models but was not used in the evaluation of model fit due to the tendency of the chi-square to over-reject true models for large samples (Bentler, 1990). Standardized regressions, coefficients or betas are presented throughout. These may be interpreted as indicators of relative effect size.

Figure 3 Autoregressive Cross-Lagged Panel Model for Baseline Analysis



Note. AG = Aggression. CP = Corporal Punishment. Lines with one arrow represent regression paths. Lines with two arrows represent correlational paths.

Baseline Model Results

Sample

In the current study, the total number of respondents in wave 4 was 1144 and the mean age was 11.3. Also, in wave 4, 51% were male (n=583) and 49% female (n=561) indicating a fairly even split between genders. In wave 5 (N=1366) the mean age was 13.7, with 51% males (n=703) and 49% females (n=663). Finally, in wave 6 (N=1447), the mean age was 15.4 and 52% (n=750) were males, with 48% (n=697) females.

Table 1 Sample Age and Gender

	Frequency	Mean Age	Males	Females
Age 11	1144	11.3	583	561
Age 13	1366	13.7	703	663
Age 15	1447	15.4	750	697

Intergenerational Transmission of Corporal Punishment: Results

Descriptive Statistics: Intergenerational Transmission of Corporal Punishment

Descriptive statistics relating to the intergenerational transmission of corporal punishment are presented in Tables 2 – 4. Based on data collected when children were aged 10, (data collection wave 3), responses were dichotomised to represent a ‘yes’ or ‘no’ response to ‘exposure to corporal punishment’ with ‘strongly disagree’ coded as 1 and all other responses coded as ‘2’. Findings show that 57% of parents reported they had experienced corporal punishment when they were children. When asked about administering corporal punishment when children were aged 10, response were dichotomised again to represent a ‘yes’ or ‘no’ responses to ‘administration of corporal punishment’ with ‘never’ being coded as 1 and all other responses coded as ‘2’. The results show 22% reported they did administer corporal punishment. Of those who were exposed to corporal punishment as a child, 33% reported administering corporal punishment to their own children.

Table 2 Parent-Reported Corporal Punishment (Exposure and Administration)

	N	M	*SD*	Range	Skewness	Kurtosis
Corporal Punishment						
Parental Exposure (Wave 3)	1054	1.81	.82	1-4	.79	-.16
Parental Administration (Wave 3)	1181	1.36	.50	1-7	2.52	15.60

Table 3 Parent-Reported Experience and Administration of Corporal Punishment

	Total	
	Yes	No
Parent experienced corporal punishment as a child. (Wave 3)	57% 526	43% 390
n	916	
Parent reported administering corporal punishment (Wave 3)	22% 163	78% 583
n	929	

Table 4 Parent-Reported Experience and Administration of Corporal Punishment Crosstabulation

		Parent reported administering corporal punishment		
		No	Yes	Total
Parent Exposed to corporal punishment	No	237 (89%)	28 (11%)	265
	Yes	211 (67%)	106 (33%)	317

Note. n=582

Correlations: Intergenerational Transmission of Corporal Punishment

As displayed in Table 5, gender was not significantly correlated with parental exposure to corporal punishment or parental administration of corporal punishment at age 10. However, there was a significant association between socioeconomic status and both parental exposure to corporal punishment (r = -.12, p<.05) and parental administration of corporal punishment at age 10 (r = -.27, p<.05). This suggests that parents from lower socioeconomic backgrounds were more likely to have experienced corporal punishment as a child and administer it when their children were

aged 10. However, these associations are quite small. There was a positive significant correlation between parental exposure to corporal punishment as a child and parent-reported administration of corporal punishment at age 10 (r = .25, p<.05). This demonstrates that parents who experienced corporal punishment as a child were also more likely to report administering it to their own children when aged 10. This finding is in line with previous research which also found that parents who experienced corporal punishment were more likely to administer it (Niu et al., 2018).

Table 5 Correlations Examining Parental Exposure to Corporal Punishment and Parental self-reported Administration of Corporal Punishment

	1	2	3	4	5	6	7
1. Gender		-.02	-.05	-.04	-.09**	-.07**	.01
2. SES			-.12**	-.27**	-.09**	-.05	-.12**
3. Parent Exposed to CP				.25**	.11**	.06	.01
4. Parent Administer CP					.17**	.15**	.13**
5. CP Age 11						.33**	.25**
6. CP Age 13							.41**
7. CP Age 15							

Note. ** p<.001 (2-tailed). CP= Corporal Punishment SES = Socioeconomic status

Hierarchical Regressions: Intergenerational Transmission of Corporal Punishment

A hierarchical regression analysis was administered to examine the predictive capability of parental exposure to corporal punishment with regards to parent-reported administration of corporal punishment (Table 6). Results indicate that socioeconomic status was a significant predictor of parent-reported corporal punishment for age 10 children (β = -.28, p<.05). This finding suggests that parents from lower socioeconomic backgrounds were more likely to report that they used corporal punishment as a punishment technique when controlling for gender. Parental exposure to corporal punishment was found to be a significant predictor of parent-reported corporal punishment for age 10 children (β = .21, p<.05). This suggests that when controlling for both gender and socioeconomic status, higher parental exposure to corporal punishment predicts a higher likelihood of administering corporal punishment, which is supported within the literature (Niu et al., 2018). When parental exposure to corporal punishment was added into the model, the amount of variance explained increased by 5%. Findings from this regression and the above correlation support the notion of an intergenerational transmission of corporal punishment.

Table 6 Hierarchical Regression Analysis for Parental Exposure to Corporal Punishment Predicting Administering Corporal Punishment at Age 10.

	Age 10 Parent-reported Corporal Punishment n = 1048			
	b	SE*(b)*	β	
Step 1				
Constant	1.80 (1.69, 1.91)	.06		
Gender	-.05 (-.11, .01)	.03	-.05	
SES	-.01 (-.01, -.01)	.01	-.28***	
R^2				.08
△F				46.83***
Step 2:				
Constant	1.52 (1.38, 1.66)	.07		
Gender	-.04 (-.10, .02)	.03	-.04	
SES	-.01 (-.01, -.01)	.01	-.26***	
Parent exposure to CP	.13 (.09, .16)	.02	.21***	
R^2				.13
△F				50.98***

Note. *p<.05. **p<.01. ***p<.001 CP = Corporal Punishment. SES = Socioeconomic Status.

Examining Main Effects between Corporal Punishment and Adolescent Aggression

Descriptive Statistics

The general estimates of corporal punishment experiences across the three timepoints are displayed in Table 7 and Table 8. Most respondents had not experienced corporal punishment in the 12 months prior to being asked. At age 11, of the 1144 responses available, 66% (n=749) reported not experiencing corporal punishment in the previous 12 months with 35% (n=395) saying they had experienced corporal punishment within the previous 12 months. At age 13 (N=1350), 71% of young people had not experienced corporal punishment in the 12 months prior and 29% had experienced corporal punishment at least once in the 12 months prior. At age 15 (N=1445), 76% (n=1100) reported they had not experienced corporal punishment in the previous 12 months and 24% (n=345) had experienced corporal punishment in the previous 12 months.

As indicated above, there was a decline in the prevalence rates of experiencing corporal punishment, which is in line with previous research (Gershoff, 2002; Harper et al., 2006; Straus & Stewart, 1999).

The distribution of male and female experiences of corporal punishment varied across ages. At age 11, 225 males (39%) had experienced corporal punishment at least once in the last 12 months and 170 females (30%) had experienced corporal punishment within the previous 12 months. At age 13, 696 (52%) individuals in the sample were male with 234 (34%) males having experienced corporal punishment one or more times in the previous 12 months. With regards to females, 152 (23%) report having experienced corporal punishment one or more times in the previous 12 months. With regards to those who experienced corporal punishment at age 15, 179 males (24%) reported having experienced corporal punishment at least once in the previous 12 months and 166 (24%) females reported having experienced corporal punishment in the previous 12 months. These findings show that males reported experiencing corporal punishment more frequently than females, which is in line with previous research (Mendez et al., 2016). Research suggests that as males often exhibit more aggression than females, they may be more likely to also elicit more corporal punishment than females.

Table 7 Corporal Punishment Descriptive Statistics

	N	M	*SD*	Range	Skewness	Kurtosis
Corporal Punishment						
Age 11	1144	1.22	0.41	1-4	2.80	10.51
Age 13	1350	1.20	0.42	1-4	2.94	10.40
Age 15	1445	1.17	0.37	1-4	2.80	8.68

Table 8 Experience of Corporal Punishment by Age and Gender

	Total		Males		Females	
	Yes	No	Yes	No	Yes	No
Age 11	35%	66%	39%	61%	30%	70%
	395	749	225	357	170	392
n	1144		582		562	
Age 13	29%	71%	34%	66%	23%	77%
	386	964	234	462	152	502
n	1350		696		654	
Age 15	24%	76%	24%	76%	24%	76%
	345	1100	179	570	166	530
n	1445		749		696	

As displayed in Table 9, levels of self-reported aggression stayed fairly similar from ages 11 to age 15 across the full sample (M_{age11} = 1.54, *SD* = .44; M_{age13} = 1.75, *SD* = .59; M_{age15} = 1.69, *SD* = .56). The combined teacher-child mean aggression scores are not included as these scores are z-scores, meaning trend information is not to be interpreted in the same way. When examining self-reported aggression split by gender, the results show that the males report, on average, higher levels of aggression than females. This is in line with previous research which often finds that males are reported to be more aggressive than females (Gershoff, 2002; Krahé, 2001; Marcus, 2017).

Table 9 Self-Reported Aggression Descriptive Statistics

	N	*M*	*SD*	Range	Skewness	Kurtosis
Self-Reported Aggression						
Age 11	1144	1.54	0.44	1-4	1.53	3.26
Males	581	1.65				
Females	563	1.43				
Age 13	1365	1.75	0.59	1-4.89	1.36	2.22
Males	703	1.90				
Females	662	1.59				
Age 15	1446	1.69	0.56	1-4.56	1.52	2.84
Males	749	1.81				
Females	697	1.56				

Correlations: Baseline Analysis

With regards to experiencing corporal punishment across time points, results indicated that corporal punishment experienced at age 11 showed a positive significant correlation with corporal punishment at age 13 (r = .33, p<.05) and age 15 (r = .25, p<.05). Significant gender differences were found regarding parental use of corporal punishment at age 11 (r = -.09, p<.05) and age 13 (r = -.07, p<.05) with males being more likely to report experiences of corporal punishment. However, there was no significant gender difference found at age 15 (r = .01, p>.05).

With regards to self-reported aggression across time points, as displayed in Table 10, age 11 aggression had a moderate correlation with age 13 aggression (r = .43, p<.05) and age 15 aggression (r = .34, p<.05). Age 13 aggression and age 15 aggression had a strong correlation (r = .55, p<.05). Similar results were found when considering the combined teacher-child aggression measure; age 11 aggression had a strong correlation with age 13 aggression (r = .54, p<.05) and a moderate correlation with age 15 aggression (r = .43, p<.05). Age 13 aggression and age 15 aggression had a strong correlation (r = .61, p<.05). Significant gender differences were found

regarding self-reported aggression with males being more likely to report increased levels of aggression at age 11 (r = -.25, p<.05), age 13 (r = -.27, p<.05) and age 15 (r = -.23, p<.05).

When looking at correlations between the two measures of aggression, self-reported and the combined teacher-child reported measures (Table 10), age 11 self-reported aggression had a strong correlation with the combined teacher-child reported measure at age 11 (r = .82, p<.05) which was also the case at age 13 (r = .83, p<.05) and age 15 (r = .81, p<.05). This is of course to be expected given that the combined teacher-child measure of aggression includes data from the child self-reported measure of aggression.

Results indicate that associations between corporal punishment and self-reported aggression were positive across all time points, with higher levels of exposure to corporal punishment being associated with higher levels of aggression. At age 11, corporal punishment was significantly correlated with aggression at age 11 (r = .32, p<.05), age 13 (r = .17, p<.05), and age 15 (r = .17, p<.05). This suggests that higher levels of corporal punishment resulted in higher levels of adolescent aggression within the same timepoint and also at older ages. Experiencing corporal punishment at age 13 was significantly correlated with aggression at age 11 (r = .12, p<.05). These results indicate that higher levels of aggression at age 11 are positively associated with higher levels of corporal punishment experienced at age 13. This suggests that there may be a bidirectional correlation between corporal punishment and aggression. Furthermore, exposure to corporal punishment at age 13 was associated with higher levels of aggression at age 13 (r = .28, p<.05), and age 15 (r = .21, p<.05). Finally, age 15 corporal punishment was significantly correlated with aggression at age 11 (r = .09, p<.05) and age 13 (r = .16, p<.05). Again, this suggests that there may be a bidirectional relation between corporal punishment and aggression with higher levels of aggression resulting in higher levels of exposure to corporal punishment. Exposure to corporal punishment at age 15 was also associated with higher levels of aggression at age 15 (r = .28, p<.05). Similar results were found for the combined teacher-child combined aggression measure.

Table 10 Correlations Between Corporal Punishment and Self-Reported Aggression

	1	2	3	4	5	6	7	8	9
Gender	-.09**	-.07**	.01	-.25**	-.27**	-.23**	-.28**	-.28**	-.24**
Corporal Punishment									
1. Age 11		.33**	.25**	.32**	.17**	.17**	.28**	.21**	.17**
2. Age 13			.41**	.12**	.28**	.21**	.16**	.29**	.19**
3. Age 15				.09**	.16**	.28**	.10**	.16**	.24**
Aggression									
4. Age 11					.43**	.34**	.82**	.41**	.34**
5. Age 13						.55**	.47**	.83**	.52**
6. Age 15							.38**	.52**	.81**
Teacher-Child Reported Aggression									
7. Age 11								.54**	.43**
8. Age 13									.61**
9. Age 15									

Note. ***p*<.001. N = 1144 – 1446.

Overall, these findings show that corporal punishment experienced at an earlier age was associated with experiencing corporal punishment at later ages. Furthermore, it was found that higher levels of exposure to corporal punishment were associated with higher levels of aggression within and across all time points. Bidirectional associations were also found which indicated that higher levels of aggression at a previous age resulted in higher levels of exposure to corporal punishment at a later age.

Regressions: Baseline Analysis

Hierarchical regression analyses were used to examine the degree to which corporal punishment predicted aggression both within and across time points. Outcome measures included both self-reported aggression and, in separate analyses, the combined teacher-child reported aggression measure as a means of comparison. For the regression analyses, the control variables were entered into the first step, and corporal punishment was entered into the second step. Similar results were found when using the combined teacher-child aggression measure as the outcome variable (Table 12, Table 14, Table 16). Regressions were then repeated to examine bidirectional relations with aggression as the predictor and corporal punishment as the outcome variable.

Regressions: Corporal Punishment Predicting Aggression

Age 11 Corporal Punishment Predicting Aggression. Table 11 displays the results of the separate regression analyses of age 11 corporal punishment predicting aggression within and

across time points. In the first step of the models, gender significantly predicted self-reported aggression at age 11 (β = -.24, p<.05), age 13 (β = -.28, p<.05) and age 15 (β = -.22, p<.05). Socioeconomic status predicted self-reported aggression at age 13 (β = -.12, p<.05) and age 15 (β = -.14, p<.05) significantly, but not at age 11 (β = -.01, p>.05; Step 1: R^2_{Age11} = .06; R^2_{Age13} = .09; R^2_{Age15} = .07). Interestingly, this demonstrates that the association between socioeconomic status and aggression increases as the young person gets older. The relation between gender and increased aggression is in line with previous research (Marcus, 2017). In the second step, corporal punishment experienced at age 11 was added to the regressions. There were significant main effects for age 11 corporal punishment and age 11 aggression with higher levels of corporal punishment linked to higher levels of aggression (β = .31, p<.05). When age 11 corporal punishment was included in the regression, the amount of variance explained increased by 9% (R^2 = .15). In the second group of analyses, the effect of age 11 corporal punishment on age 13 aggression was examined. There were significant main effects for age 11 corporal punishment and age 13 aggression with higher levels of corporal punishment linked to higher levels of aggression (β = .16, p<.05). When age 11 corporal punishment was included in the regression, the amount of variance explained increased by 2% (R^2 = .11). In the third group of analyses, the effect of age 11 corporal punishment on age 15 aggression was examined. There were significant main effects for age 11 corporal punishment and age 15 aggression with higher levels of corporal punishment linked to higher levels of aggression (β = .16, p<.05). When age 11 corporal punishment was included in the regression, the amount of variance explained increased by 2% (R^2 = .09).

Age 13 Corporal Punishment Predicting Aggression. Table 13 shows the results of the separate regression analyses of age 13 corporal punishment predicting concurrent aggression at age 13 and subsequent aggression at age 15. In the first step of the models, gender significantly predicted self-reported aggression at age 13 (β = -.27, p<.05) and 15 (β = -.21, p<.05) and socioeconomic status predicted self-reported aggression at age 13 (β = -.13, p<.05) and age 15 (β = -.15, p<.05; Step 1: R^2_{Age13} = .09; R^2_{Age15} = .07). In the second step, corporal punishment experienced at age 13 was added to the regressions. There were significant main effects for age 13 corporal punishment and age 13 aggression with higher levels of corporal punishment linked to higher levels of aggression (β = .27, p<.05). When age 13 corporal punishment was included in the regression, the amount of variance explained increased by 7% (R^2 = .16). In the second group of analyses, the effect of age 13 corporal punishment on age 15 aggression was examined. There were significant main effects for age 13 corporal punishment and age 15 aggression with

higher levels of corporal punishment linked to higher levels of aggression (β = .19, p<.05). When age 13 corporal punishment was included in the regression, the amount of variance explained increased by 3% (R^2 = .10).

Age 15 Corporal Punishment Predicting Aggression. Table 15 shows the results of the separate regression analysis with age 15 corporal punishment predicting aggression at age 15. In the first step of the model, gender significantly predicted self-reported aggression at 15 (β = -.22, p<.05) and socioeconomic status predicted self-reported aggression at age 15 (β = -.15, p<.05; Step 1: R^2 = .07). In the second step, corporal punishment experienced at age 15 was added to the regressions. There were significant main effects for age 15 corporal punishment and age 15 aggression with higher levels of corporal punishment linked to higher levels of aggression (β = .30, p<.05). When age 15 corporal punishment was included in the regression, the amount of variance explained increased by 9% (R^2 = .16).

Overall, these findings show that gender significantly predicted aggression within all timepoints which indicates that in our sample males had a stronger association with aggression than females. Furthermore, socioeconomic status significantly predicted aggression for ages 13 and 15, but not for ages 11. This indicates that the association between socioeconomic status and aggression increases as the young person gets older. The direction of the relation between socioeconomic status and aggression shows that young people from lower socioeconomic backgrounds were more likely to display higher levels of aggression. Based on the combination of these two factors, it could be argued that males from lower socioeconomic backgrounds were most likely to display increased levels of aggression within our sample. When considering the predictive capabilities of corporal punishment, the results show that corporal punishment significantly predicted aggression both within and across time points. This means that increased exposure to corporal punishment significantly predicted an increase in aggression. The largest amount of variance explained in the model by corporal punishment was in relation to concurrent levels of aggression. That is to say, exposure to corporal punishment had the strongest predictive capability of aggression within the same timepoint.

Table 11 Hierarchical Regression Analysis for Age 11 Corporal Punishment Predicting Self-Reported Aggression at Age 11, 13 and 15, with 95% CI Reported in Parentheses.

	Age 11 Aggression				Age 13 Aggression				Age 15 Aggression			
	n= 1045				n = 943				n = 994			
	b	*SE*(*b*)	β		*b*	*SE*(*b*)	β		*b*	*SE*(*b*)	β	
Step 1												
Constant	1.86 (1.75, 1.97)	.05			2.39 (2.25, 2.54)	.07			2.22 (2.09, 2.36)	.07		
Gender	-.21 (-.26, -.16)	.03	-.23***		-.33 (-.40, -.25)	.04	-.28***		-.24 (-.31, -.17)	.03	-.22***	
SES	.00 (-.01, .01)	.01	-.01		-.01 (-.01, -.01)	.01	-.12***		-.01 (-.01, -.01)	.01	-.14***	
R^2				.06				.09				.07
△F				30.93***				46.34***				35.23***
Step 2:												
Constant	1.40 (1.27, 1.53)	.07			2.08 (1.90, 2.27)	.10			1.93 (1.76, 2.11)	.09		
Gender	-.19 (-.24, -.14)	.03	-.21***		-.31 (-.38, -.24)	.04	-.26***		-.23 (-.29, -.16)	.03	-.20***	
SES	.01 (-.01, .01)	.01	.02		-.01 (-.01, -.01)	.01	-.11**		-.01 (-.01, -.01)	.01	-.13***	
CP Age 11	.33 (.27, .39)	.03	.31***		.22 (.13, .30)	.04	.16***		.20 (.13, .28)	.04	.16***	
R^2				.15				.11				.09
△F				113.98***				25.01***				25.81***

Note. **p*<.05. ***p*<.01. ****p*<.001. CP = Corporal Punishment. SES = Socioeconomic Status.

Table 12 Hierarchical Regression Analysis for Age 11 Corporal Punishment Predicting Teacher-Child Reported Aggression at Age 11, 13 and 15, with 95% CI Reported in Parentheses.

	Age 11 Aggression				Age 13 Aggression				Age 15 Aggression			
	n= 950				n = 869				n = 876			
	b	SE(*b*)	β		*b*	SE(*b*)	β		*b*	SE(*b*)	β	
Step 1												
Constant	.80 (.59, 1.00)	.11			1.01 (.81, 1.21)	.10			.89 (.69, 1.10)	.10		
Gender	-.46 (-.55, -.36)	.05	-.28***		-.47 (-.57, -.37)	.05	-.30***		-.37 (-.47, -.27)	.05	-.24***	
SES	-.01 (-.01, .00)	.01	-.06		-.01 (-.01, -.01)	.01	-.17***		-.01 (-.01, -.01)	.01	-.19***	
R^2				.08				.12				.09
△F				41.04***				56.66***				43.15***
Step 2:												
Constant	.02 (-.24, .29)	.14			.48 (.22, .734)	.13			.46 (.20, .73)	.14		
Gender	-.42 (-.51, -.32)	.05	-.25***		-.43 (-.53, -.34)	.05	-.28***		-.35 (-.45, -.25)	.05	-.22***	
SES	-.01 (-.01, .01)	.01	-.03		-.01 (-.01, -.01)	.01	-.15***		-.01 (-.01, -.01)	.01	-.18***	
CP Age 11	.53 (.41, .65)	.06	.26***		.36 (.25, .47)	.06	.20***		.31 (.18, .43)	.06	.16***	
R^2				.15				.15				.11
△*F*				73.57***				38.61***				23.95***

Note. **p*<.05. ***p*<.01. ****p*<.001. CP = Corporal Punishment. SES = Socioeconomic Status.

Table 13 Hierarchical Regression Analysis for Age 13 Corporal Punishment Predicting Self-Reported Aggression at Age 13 and 15, with 95% CI Reported in Parentheses.

	Age 13 Aggression n = 1042				Age 15 Aggression n = 1017			
	b	SE(*b*)	β		*b*	SE(*b*)	β	
Step 1								
Constant	2.41 (2.27, 2.55)	.07			2.23 (2.10, 2.36)	.07		
Gender	-.32 (-.39, -.25)	.04	-.27***		-.24 (-.30, -.17)	.03	-.21***	
SES	-.01 (-.01, -.01)	.01	-.13***		-.01 (-.01, -.01)	.01	-.15***	
R^2				.09				.07
△F				48.84***				36.33***
Step 2:								
Constant	1.88 (1.71, 2.06)	.09			1.88 (1.71, 2.05)	.09		
Gender	-.29 (-.36, -.23)	.03	-.25***		-.22 (-.28, -.16)	.03	-.20***	
SES	-.01 (-.01, -.01)	.01	-.11***		-.01 (-.01, -.01)	.01	-.14***	
CP Age 13	.39 (.31, .48)	.04	.27***		.26 (.18, .34)	.04	.19***	
R^2				.16				.10
△F				90.25***				39.05***

Note. **p*<.05. ***p*<.01. ****p*<.001. CP = Corporal Punishment. SES = Socioeconomic Status.

Table 14 Hierarchical Regression Analysis for Age 13 Corporal Punishment Predicting Teacher-Child Aggression at Age 13 and 15, with 95% CI Reported in Parentheses.

	Age 13 Aggression				Age 15 Aggression			
	n = 957				n = 894			
	b	SE(*b*)	β		*b*	SE(*b*)	β	
Step 1								
Constant	1.05 (.86, 1.25)	.10			.91 (.71, 1.11)	.10		
Gender	-.47 (-.56, -.37)	.05	-.29***		-.38 (-.48, -.28)	.05	-.24***	
SES	-.01 (-.01, -.01)	.01	-.18***		-.01 (-.01, -.01)	.01	-.19***	
R^2				.11				.09
△F				61.02***				44.26***
Step 2:								
Constant	.34 (.09, .58)	.12			.47 (.20, .73)	.13		
Gender	-.42 (-.51, -.33)	.05	-.26***		-.36 (-.45, -.26)	.05	-.23***	
SES	-.01 (-.10, -.01)	.01	-.17***		-.01 (-.01, -.01)	.01	-.18***	
CP Age 13	.52 (.40, .63)	.06	.27***		.33 (.20, .45)	.06	.16***	
R^2				.18				.12
△F				81.64***				26.76***

Note. **p*<.05. ***p*<.01. ****p*<.001. CP = Corporal Punishment. SES = Socioeconomic Status.

Table 15 Hierarchical Regression Analysis for Age 15 Corporal Punishment Predicting Self-Reported Aggression at Age 15, with 95% CI Reported in Parentheses.

	Age 15 Aggression			
	n = 1128			
	b	SE(*b*)	β	
Step 1				
Constant	2.24	.06		
	(2.11, 2.36)			
Gender	-.24	.03	-.22***	
	(-.30, -.18)			
SES	-.01	.00	-.15***	
	(-.01, -.00)			
R^2				.07
△F				41.17***
Step 2:				
Constant	1.66	.08		
	(1.50, 1.81)			
Gender	-.24	.03	-.22***	
	(-.30, -.18)			
SES	-.00	.00	-.12***	
	(-.01, -.00)			
CP	.46	.04	.30***	
Age 15	(.38, .55)			
R^2				.16
△F				118.22***

Note. *p<.05. **p<.01. ***p<.001. CP = Corporal Punishment. SES = Socioeconomic Status.

Table 16 Hierarchical Regression Analysis for Age 15 Corporal Punishment Predicting Teacher-Child Reported Aggression at Age 15, with 95% CI Reported in Parentheses.

	Age 15 Aggression			
	n = 990			
	b	SE(*b*)	β	
Step 1				
Constant	.93 (.73, 1.12)	.10		
Gender	-.38 (-.48, -.29)	.05	-.24***	
SES	-.01 (-.01, -.01)	.00	-.19***	
R^2				.09
△F				49.82***
Step 2:				
Constant	.28 (.03, .52)	.13		
Gender	-.38 (-.48, -.29)	.05	-.24***	
SES	-.01 (-.10, -.01)	.00	-.17***	
CP Age 15	.52 (.39, .65)	.07	.24***	
R^2				.15
△F				64.50***

Note. *p<.05. **p<.01. ***p<.001. CP = Corporal Punishment. SES = Socioeconomic Status.

Bidirectional Regressions: Aggression Predicting Corporal Punishment

As discussed in Chapter 2, when examining the impact of corporal punishment on adolescent aggression, one common debate is whether or not corporal punishment leads to an increase in adolescent aggression, or if childhood aggression is what triggered the use of corporal punishment (Gershoff et al., 2010; Lansford et al., 2017; Lytton & Romney, 1991; Sheehan & Watson, 2008). To explore bidirectional relations between corporal punishment and adolescent aggression, hierarchical regressions were repeated while swapping predictor and outcome variables. The first group of regression analyses examined whether age 11 aggression predicted corporal punishment at ages 11, 13 and 15. The next group of regressions included age 13 aggression to determine if it predicted age 13 and 15 corporal punishment. Finally, age 15 aggression was entered as the predictor of age 15 corporal punishment.

Age 11 Self-Reported Aggression Predicting Corporal Punishment. Table 17 shows the results of the separate regression analyses of age 11 self-reported aggression predicting corporal punishment within and across time points. In the first step of the model, gender significantly predicted corporal punishment at age 11 (β = -.09, p<.05), age 13 (β = -.09, p<.05) but not at age 15 (β = .01, p>.05) meaning that boys were more likely to experience corporal punishment than girls at ages 11 and 13. Furthermore, socioeconomic status predicted corporal punishment significantly at age 11 (β = -.09, p<.05), and age 15 (β = -.11, p<.05) but not 13 (β = -.06, p>.05; Step 1: R^2_{Age11} = .02; R^2_{Age13} = .01; R^2_{Age15} =.01). This suggests that parents of higher socioeconomic status were less likely to use corporal punishment at ages 11 and 15. In the second step, aggression at age 11 was added to the regressions. There were significant main effects for age 11 aggression predicting age 11 corporal punishment with higher levels of aggression linked to higher levels of corporal punishment (β = .32, p<.05). When age 11 aggression was entered into the regression, the amount of variance explained increased by 9% (R^2 = .11). In the second group of analyses, the effect of age 11 aggression on age 13 corporal punishment was examined. There were significant main effects for age 11 aggression predicting age 13 corporal punishment with higher levels of aggression linked to higher levels of corporal punishment (β = .10, p<.05). When age 11 aggression was included in the regression, the amount of variance explained increased by 1% (R^2 = .02). In the third group of analyses, the effect of age 11 aggression on age 15 corporal punishment was examined. There were significant main effects for age 11 aggression predicting age 15 corporal punishment (β = .11, p<.05). When age 11 aggression was included in the regression, the amount of variance explained increased by 1% (R^2 = .02).

Age 13 Self-Reported Aggression Predicting Corporal Punishment. Table 19 shows the results of the separate regression analyses of age 13 aggression predicting corporal punishment at age 13 and 15. In the first step of the group of models, gender significantly predicted corporal punishment at age 13 (β = -.81, p<.05) but not age 15 (β = -.01, p>05); socioeconomic status predicted corporal punishment at age 15 (β = -.10, p<.01) but not at age 13 (β = -.05, p>.05; Step 1: R^2_{Age13} = .01, R^2_{Age15} = .01)**.** Again, this demonstrates that boys were more likely than girls to experience corporal punishment at age 15 and parents of higher socioeconomic status were less likely to use corporal punishment at age 15. In the second step, age 13 aggression was added to the regressions. There were significant main effects for age 13 aggression predicting age 13 corporal punishment with higher levels of aggression linked with higher levels of corporal punishment (β = .30, p<.05). When age 13 aggression was included in the regression, the amount

of variance explained increased by 8% (R^2 = .09). In the second group of analyses, the effect of age 13 aggression on age 15 corporal punishment was examined. There was a significant main effect for age 13 aggression predicting age 15 corporal punishment with higher levels of aggression linked to higher levels of corporal punishment (β = .18, p<.05). When age 13 aggression was included in the regression, the amount of variance explained increased by 3% (R^2 = .04).

Age 15 Self-Reported Aggression Predicting Corporal Punishment. Table 21 shows the results of the regression analysis of age 15 aggression predicting age 15 corporal punishment. In the first step of the model, gender was not a significant predictor of corporal punishment (β = .01, p>.05); however, socioeconomic status was (β = -.12, p<.05; Step 1 R^2 = .01). However, while the predictive capability of age 15 socioeconomic status on age 15 corporal punishment was significant, the amount of variance explained was very small. In the second step, age 15 aggression was added to the regression. There was a significant main effect for age 15 aggression and age 15 corporal punishment, with higher levels of aggression linked to higher levels of corporal punishment (β = .32, p<.05). When age 15 aggression was included in the regression, the amount of variance explained increased by 10% (R^2 = .11).

Overall, these findings show that gender was a significant predictor of corporal punishment at ages 11 and 13, but not age 15. The direction of the significant main effects demonstrate that males were more likely to experience corporal punishment than were females. Furthermore, results show that socioeconomic status was a significant predictor of corporal punishment at ages 11 and 15, but not age 13. This suggests that parents from lower socioeconomic backgrounds were more likely to use corporal punishment when compared with those from higher socioeconomic backgrounds (however, the amount of variance explained was very small). Taking these two factors together, it could be suggested that males from lower socioeconomic backgrounds were more likely to experience corporal punishment. When considering the predictive capability of aggression on corporal punishment, the results demonstrate that aggression is a significant predictor of corporal punishment across all timepoints. The positive main effects suggest that higher levels of aggression were predictive of an increased likelihood of experiencing corporal punishment. The largest amount of variance explained in the model by aggression was in relation to concurrent levels of experiencing corporal punishment. That is to say, exposure to adolescent aggression had the strongest predictive capability of corporal punishment within the same timepoints.

Table 17 Hierarchical Regression Analysis for Age 11 Self-Reported Aggression Predicting Corporal Punishment at Age 11, 13 and 15, with 95% CI Reported in Parentheses.

	Age 11 Corporal Punishment n= 1045				Age 13 Corporal Punishment n = 931				Age 15 Corporal Punishment n = 994			
	b	SE(*b*)	β		*b*	SE(*b*)	β		*b*	SE(*b*)	β	
Step 1												
Constant	1.43 (1.33, 1.53)	.05			1.35 (1.24, 1.45)	.05			1.24 (1.15, 1.32)	.04		
Gender	-.07 (-.13, -.02)	.03	-.09**		-.071 (-.12, -.02)	.03	-.09**		.00 (-.04, .04)	.02	.01	
SES	-.01 (-.01, -.01)	.01	-.09**		-.01 (-.01, .00)	.01	-.06		-.01 (-.01, -.01)	.01	-.11**	
R^2				.02				.01				.01
△F				7.97***				5.10**				6.09**
Step 2:												
Constant	.86 (.72, 1.01)	.07			1.17 (1.02, 1.33)	.08			1.08 (.96, 1.21)	.06		
Gender	-.01 (-.06, .04)	.03	-.01		-.05 (-.10, .01)	.03	-.06		.02 (-.02, .06)	.02	.03	
SES	-.01 (-.01, -.00)	.01	-.09**		-.01 (-.10, .01)	.01	-.06		-.01 (-.00, -.00)	.01	-.11***	
Age 11 Aggression	.30 (.25, .36)	.03	.32***		.09 (.03, .15)	.03	.10**		.08 (.03, .13)	.03	.11**	
R^2				.11				.02				.02
△F				113.98***				9.08**				11.16**

Note. **p*<.05. ***p*<.01. ****p*<.001. SES = Socioeconomic Status.

Table 18 Hierarchical Regression Analysis for Age 11 Teacher-Child Reported Aggression Predicting Corporal Punishment at Age 11, 13 and 15, With 95% CI Reported in Parentheses.

	Age 11 Corporal Punishment n= 950				Age 13 Corporal Punishment n = 850				Age 15 Corporal Punishment n = 905			
	b	SE(*b*)	β		*b*	SE(*b*)	β		*b*	SE(*b*)	β	
Step 1												
Constant	1.46 (1.35, 1.56)	.05			1.36 (1.25, 1.47)	.06			1.23 (1.14, 1.32)	.05		
Gender	-.08 (-.13, -.03)	.03	-.10**		-.07 (-.13, -.02)	.03	-.09		.01 (-.03, .06)	.02	.02	
SES	-.01 (-.01, -.01)	.01	-.11***		-.01 (-.01, .01)	.01	-.07		-.01 (-.01, -.01)	.01	-.12***	
R^2				.02				.01				.02
△F				10.42***				5.54**				6.95**
Step 2:												
Constant	1.35 (1.25, 1.45)	.05			1.32 (1.20, 1.43)	.06			1.19 (1.10, 1.30)	.05		
Gender	-.02 (-.07, .04)	.03	-.02		-.05 (-.10, .01)	.03	-.06		.04 (-.01, .08)	.02	.05	
SES	-.01 (-.01, -.01)	.01	-.10**		-.01 (-.003, .000)	.01	-.06		-.01 (-.01, -.01)	.01	-.12***	
Age 11 Aggression	.14 (.11, .17)	.02	.28***		.06 (.02, .09)	.02	.12		.047 (.02, .08)	.01	.12**	
R^2				.09				.03				.03
△F				73.57***				11.19**				11.30**

Note. **p*<.05. ***p*<.01. ****p*<.001. SES = Socioeconomic Status.

Table 19 Hierarchical Regression Analysis for Age 13 Self-Reported Aggression Predicting Corporal Punishment at Age 13 and 15, With 95% CI Reported in Parentheses.

	Age 13 Corporal Punishment				Age 15 Corporal Punishment			
	n = 1042				n = 1029			
	b	SE(*b*)	β		*b*	SE(*b*)	β	
Step 1								
Constant	1.34 (1.24, 1.44)	.05			1.25 (1.16, 1.34)	.05		
Gender	-.07 (-.12, -.02)	.03	-.81*		-.01 (-.05, .04)	.02	-.01	
SES	-.01 (-.01, .00)	.01	-.05		-.01 (-.01, -.01)	.01	-.10**	
R^2				.01				.01
△F				4.49*				5.60**
Step 2:								
Constant	.85 (.71, .99)	.07			.99 (.86, 1.12)	.07		
Gender	-.01 (-.05, .05)	.03	-.01		.03 (-.01, .08)	.02	.05	
SES	.01 (-.01, .01)	.01	-.01		-.01 (-.01, .01)	.01	-.08**	
Age 13 Aggression	.20 (.16, .25)	.02	.30***		.11 (.07, .15)	.02	.18***	
R^2				.09				.04
△F				90.25***				30.65***

Note. *p<.05. ** p<.01. *** p<.001. SES = Socioeconomic Status.

Table 20 Hierarchical Regression Analysis for Age 13 Teacher-Child Reported Aggression Predicting Corporal Punishment at Age 13 and 15, with 95% CI Reported in Parentheses.

	Age 13 Corporal Punishment				Age 15 Corporal Punishment			
	n = 957				n = 945			
	b	SE(*b*)	β		*b*	SE(*b*)	β	
Step 1								
Constant	1.39 (1.28, 1.50)	.05			1.28 (1.18, 1.37)	.05		
Gender	-.09 (-.14, -.04)	.03	-.11**		-.01 (-.05, .04)	.02	-.01	
SES	-.01 (-.01, .00)	.01	-.06		-.01 (-.01, -.01)	.01	-.12***	
R^2				.02				.01
△F				7.16**				6.39**
Step 2:								
Constant	1.23 (1.12, 1.33)	.06			1.20 (1.10, 1.30)	.05		
Gender	-.02 (-.071, .03)	.03	-.02		.03 (-.02, .08)	.03	.04	
SES	.01 (-.01, .00)	.01	-.01		-.01 (-.01, .01)	.01	-.09**	
Age 13 Aggression	.15 (.12, .19)	.02	.30***		.08 (.05, .11)	.02	.17***	
R^2				.09				.04
△F				81.64***				23.71***

Note. *p<.05. ** p<.01. *** p<.001. SES = Socioeconomic Status.

Table 21 Hierarchical Regression Analysis for Age 15 Self-Reported Aggression Predicting Corporal Punishment at Age 15, with 95% CI Reported in Parentheses.

	Age 15 Corporal Punishment			
	n = 1128			
	b	SE(*b*)	β	
Step 1				
Constant	1.26 (1.17, 1.34)	.04		
Gender	.01 (-.04, .04)	.02	.01	
SES	-.01 (-.01, -.01)	.01	-.12***	
R^2				.01
△F				7.64**
Step 2:				
Constant	.78 (.68, .91)	.06		
Gender	.05 (.01, .09)	.02	.07*	
SES	-.01 (-.01, .00)	.01	-.07*	
Age 15 Aggression	.21 (.17, .24)	.02	.32***	
R^2				.11
△F				118.22***

Note. *p<.05. **p<.01. ***p<.001. SES = Socioeconomic Status.

Table 22 Hierarchical Regression Analysis for Age 15 Teacher-Child Reported Aggression Predicting Corporal Punishment at Age 15, with 95% CI Reported in Parentheses.

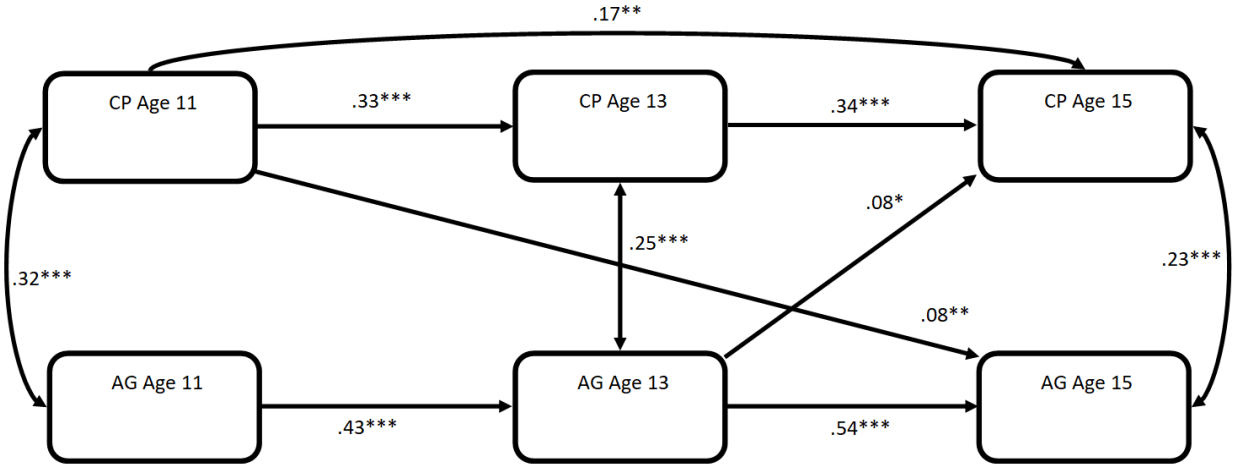
	Age 15 Corporal Punishment			
	n = 990			
	b	SE(*b*)	β	
Step 1				
Constant	1.25 (1.16, 1.34)	.05		
Gender	.01 (-.04, .05)	.02	.01	
SES	-.01 (-.01, -.01)	.01	-.11***	
R^2				.01
△F				6.22**
Step 2:				
Constant	1.14 (1.05, 1.23)	.05		
Gender	.05 (.01, .10)	.02	.07*	
SES	-.01 (-.01, .00)	.01	-.06*	
Age 15 Aggression	.12 (.09, .15)	.02	.26***	
R^2				.07
△F				64.50***

Note. *p<.05. **p<.01. ***p<.001. SES = Socioeconomic Status.

Autoregressive Cross-Lagged Analysis: Baseline Analysis

In the baseline model, I specified the autoregressive cross-lagged panel model presented in Figure 3. The concurrent correlations between corporal punishment and aggression were also included in the model. Including all regression lines and correlations in the model led to a poor fit of the data $X^2(2) = 24.187$, $p<.05$, CFI = 0.97, TLI = 0.76, RMSEA = .08. Inspection of modification indices indicated no real substantial improvement to the model by adding more paths. Therefore, non-significant regressions were removed from the model. Paths that had the smallest R^2 change in the hierarchical regressions were considered for removal first, not including the path from age 11 corporal punishment to age 15 aggression as this was the path this study is most interested in. First, the path from age 11 corporal punishment to age 13 aggression was removed, however, this did not result in an acceptable fit to the data and was re-added to the model. The second non-significant path that was removed was from age 13 corporal punishment to age 15 aggression. This improved the model fit slightly; however, it was still not within the ideal thresholds $X^2(3) = 23.67$, $p<.05$, CFI = .97, TLI = .85, RMSEA = .07. Inspection of the modification indices with the removal of the age 13 corporal punishment to age 15 aggression path suggested the inclusion of a regression path from age 11 corporal punishment to age 15 corporal punishment. This was added to the model which improved the model fit $X^2(2) = 9.78$, $p>.05$, RMSEA = .05, 90% CI [0.02, 0.08], CFI = .99 TLI = .92. Results of the final model are displayed in Figure 4 with only statistically significant paths displayed. Fully standardized parameter estimates indicate that inter-individual differences in corporal punishment ($\beta_{Age11\text{-}13} = .33$, $p<.05$ and $\beta_{Age13\text{-}15} = .34$, $p<.05$) and aggression ($\beta_{Age11\text{-}13} = .43$, $p<.05$ and $\beta_{Age13\text{-}15} = .54$, $p<.05$) were moderately stable over time. With regards to corporal punishment predicting subsequent aggression (across time points) I found that age 11 corporal punishment significantly predicted age 15 aggression ($\beta = .08$, $p<.05$). A bidirectional effect was identified with age 13 aggression significantly predicting age 15 corporal punishment ($\beta = .08$, $p<.05$) when accounting for previous levels of aggression. With regards to the correlations within this model, the significant positive associations between corporal punishment and aggression at age 11 ($r = .32$, $p<.05$), age 13 ($r = .25$, $p<.05$) and age 15 ($r = .23$, $p<.05$) showed that higher initial levels of corporal punishment were associated with higher levels of aggression when controlling for stability effects.

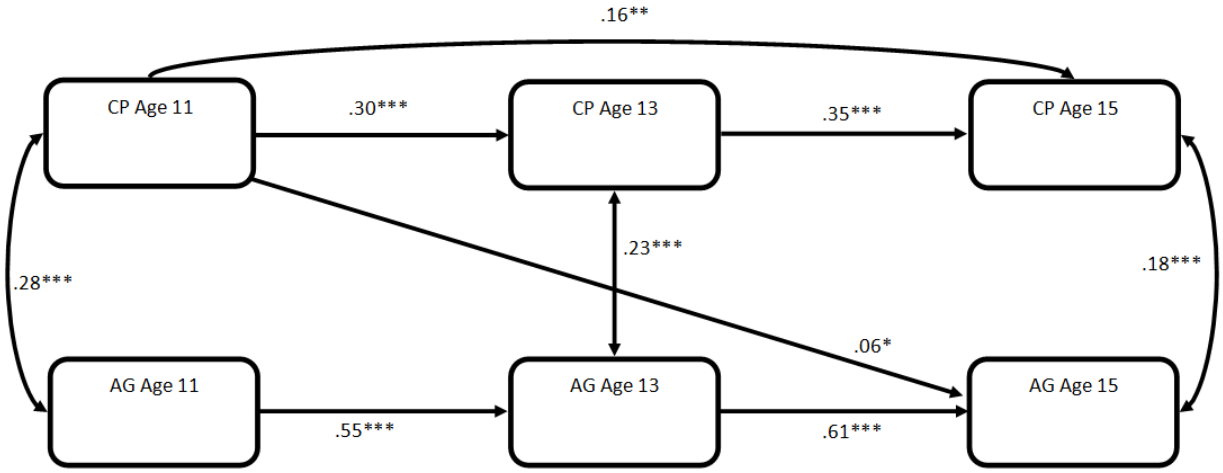
Figure 4 Autoregressive Cross-Lagged Panel Model Including Self-Reported Aggression.



Note. *p<.05, **p<.01, ***p<.001. AG = Aggression. CP = Corporal Punishment. Lines with one arrow represent regression paths. Lines with two arrows represent correlational paths.

With regards to the combined teacher-child aggression measure, I replicated the self-reported aggression baseline model (with the same paths added/removed), however, this did not result in a good fit to the data ($X^2(2) = 12.83$, p<.05, CFI = .99, TLI = .90, RMSEA = .06). I then tested the model with all original paths included (Figure 3) which also resulted in a poor fit to the data ($X^2(2) = 26.70$, p<.05, CFI = .97, TLI = .76, RMSEA = .09). Removing non-significant paths (age 13 corporal punishment to age 15 aggression and age 11 corporal punishment to age 13 aggression) and adding paths recommended by the modification indices (age 11 corporal punishment to age 15 corporal punishment) improved the model fit ($X^2(3) = 15.80$, p<.05, RMSEA = .05, 90% CI [0.03, 0.08], CFI = .98 TLI = .92) and resulted in the model presented in Figure 5. Fully standardized parameter estimates indicate that inter-individual differences in corporal punishment ($\beta_{Age11\text{-}13} = .30$, p<.05 and $\beta_{Age13\text{-}15} = .35$, p<.05) and aggression ($\beta_{Age11\text{-}13} = .55$, p<.05 and $\beta_{Age13\text{-}15} = .61$, p<.05) were stable over time. With regards to corporal punishment predicting subsequent aggression (across time points) I found that age 11 corporal punishment significantly predicted age 15 aggression ($\beta = .06$, p<.05) when accounting for previous levels of aggression. With regards to the correlations within this model, the significant positive associations between corporal punishment and the combined teacher-reported aggression measure at age 11 ($r = .32$, p<.05), age 13 ($r = .25$, p<.05) and age 15 ($r = .23$, p<.05) showed that higher initial levels of corporal punishment were associated with higher levels of aggression when controlling for stability effects. There were no significant bidirectional relations found when using the combined teacher-child aggression outcome measure.

Figure 5 Autoregressive Cross-Lagged Panel Model with the Combined Teacher-Child Reported Aggression Measure.



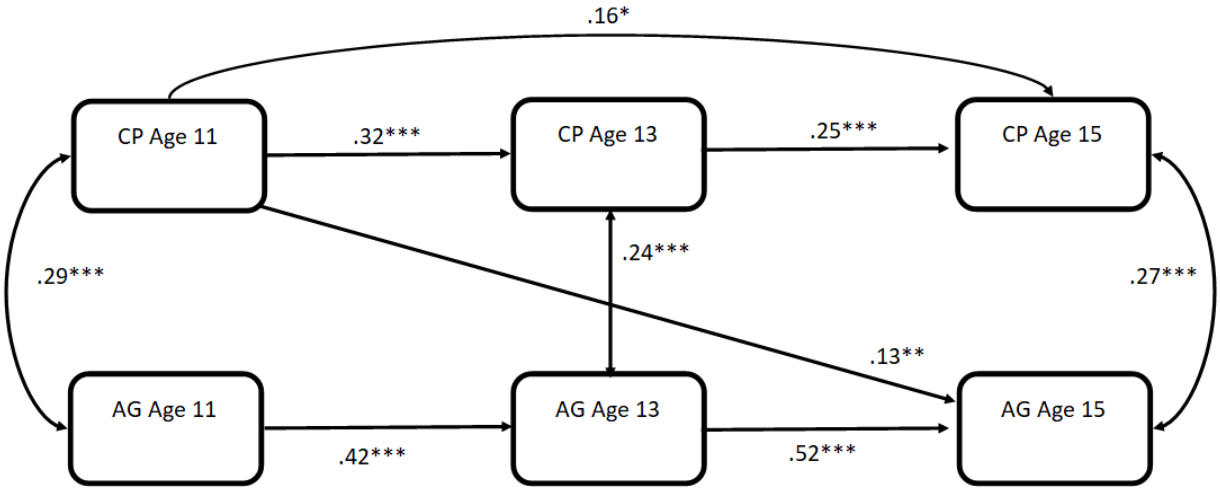
Note. *p<.05, **p<.01, ***p<.001. AG = Aggression. CP = Corporal Punishment. Lines with one arrow represent regression paths. Lines with two arrows represent correlational paths.

Gender Differences. To determine whether main effects and bidirectional relations between corporal punishment and aggression were different for males and females, a separate model was fit. The main model (Figure 3) with cross-lagged paths estimated freely for girls and boys provided a poor fit to the data ($X^2(4) = 21.52$, p<.05, CFI = .97, TLI = .80, RMSEA = .08); therefore, a path that was non-significant for both males and females was removed from the model (age 11 aggression to age 13 corporal punishment). However, this still did not result in an ideal fit to the data ($X^2(6) = 24.12$, p<.05, CFI = .97, TLI = .86, RMSEA = .06). As per the previous models, modification indices recommended the addition of the path age 11 corporal punishment to age 15 corporal punishment. Once this was added, the model provided a good fit to the data ($X^2(4) = 9.66$, p<.05, CFI = .99, TLI = .94, RMSEA = .04). The results for the autoregressive cross-lagged analysis for males is displayed in Figure 6, and Figure 7 for females, with only statistically significant paths displayed.

Males. Fully standardized parameter estimates indicate that inter-individual differences in corporal punishment ($\beta_{Age11\text{-}13} = .32$, p<.05 and $\beta_{Age13\text{-}15} = .25$, p<.05) and aggression ($\beta_{Age11\text{-}13} = .24$, p<.05 and $\beta_{Age13\text{-}15} = .52$, p<.05) were stable over time. With regards to corporal punishment predicting subsequent aggression (across time points), results indicate that age 11 corporal punishment significantly predicted age 15 aggression for males ($\beta = .13$, p<.05). With regards to correlations in the model including males, the significant positive associations between corporal punishment and aggression at ages 11 ($r = .29$, p<.05), age 13 ($r = .24$, p<.05) and age 15 (r =

.27, *p*<.05) showed that higher initial levels of corporal punishment were associated with higher levels of aggression when controlling for stability effects. For males, there were no significant bidirectional paths identified in this model.

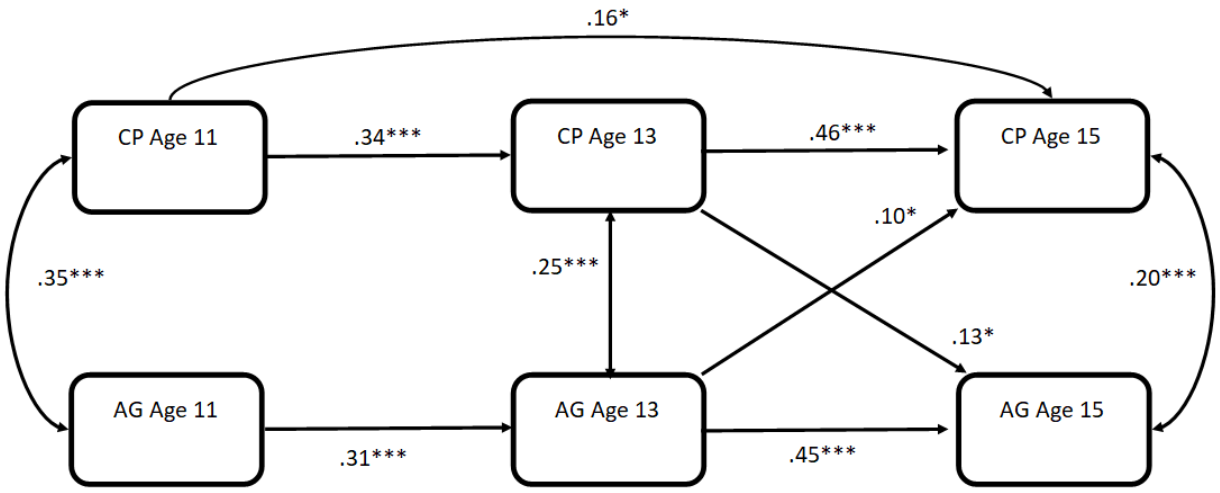
Figure 6 Results of Autoregressive Cross-lagged Model for Males



Note. *p<.05, **p<.01, ***p<.001. AG = Aggression. CP = Corporal Punishment. Lines with one arrow represent regression paths. Lines with two arrows represent correlational paths.

Females. As was the case with the previous models, fully standardized parameter estimates indicate that inter-individual differences in corporal punishment ($\beta_{Age11\text{-}13}$ = .34, *p*<.05 and $\beta_{Age13\text{-}15}$ = .46, *p*<.05) and aggression ($\beta_{Age11\text{-}13}$ = .31, *p*<.05 and $\beta_{Age13\text{-}15}$ = .45, *p*<.05) were stable over time. With regards to corporal punishment predicting subsequent aggression (across time points), there was no significant path identified between age 11 corporal punishment and age 15 aggression for females, which differed from all previous models (β = -.04, *p*>.05). However, different from the males, in the female model it was found that age 13 corporal punishment significantly predicted age 15 aggression (β = .13, *p*<.05). As was the case in the main baseline model, a bidirectional path was identified with age 13 aggression significantly predicting age 15 corporal punishment for females (β = .10, *p*<.05) when accounting for previous levels of aggression. With regards to correlations in the model including females, the significant positive associations between corporal punishment and aggression at ages 11 (*r* = .35, *p*<.05), age 13 (*r* = .24, *p*<.05) and age 15 (*r* = .20, *p*<.05) showed that higher initial levels of corporal punishment were associated with increased aggression when controlling for stability effects.

Figure 7 Results of Autoregressive Cross-Lagged Model for Females



Note. *p<.05, **p<.01, ***p<.001. AG = Aggression. CP = Corporal Punishment. Lines with one arrow represent regression paths. Lines with two arrows represent correlational paths.

Discussion of Baseline Analyses

Corporal punishment has been linked to increased aggression in children and adolescents in previous research (Bandura & Walters, 1959; Gershoff, 2002; Krahé, 2001; Patterson, 1982). However, subsequent aggression may become apparent after only a short delay, or there may be lagged effects. Corporal punishment has also been argued to be a positive way to control undesirable behaviour by some (Larzelere & Kuhn, 2005), with others arguing there are no substantial negative effects (Morris & Gibson, 2011). However, others report that corporal punishment can cause subsequent aggression (Evans et al., 2012; Herrenkohl et al., 2003; Simons & Wurtele, 2010; Weiss et al., 1992) because of the impact corporal punishment can have on social information processing, emotional regulation, and increased aggressive responses to social cues. Furthermore, research has also questioned the bidirectional relation between corporal punishment and aggression, questioning whether or not it is corporal punishment that leads to higher levels of aggression, or if higher levels of aggression is what leads to increased exposure to corporal punishment (Keijsers et al., 2011; Sheehan & Watson, 2008; Wang & Kenny, 2014).

The purpose of this chapter was to determine the extent to which corporal punishment can predict subsequent aggression and to examine any potential bidirectional associations. The present study examined the link between parents' use of corporal punishment and the change in adolescent aggressive behaviour in a European sample using autoregressive cross-lagged panel

models to account for previous levels of aggression. I hypothesised that there would be a significant main effect between corporal punishment and aggression. My findings provided support for this hypothesis. Overall, these findings indicated there was a significant main effect between corporal punishment and aggression, with evidence of a bidirectional effect and gender differences.

This chapter examined the main effects and bidirectional relations between parents' use of corporal punishment and aggression, accounting for continuity over time in both corporal punishment and aggression in a longitudinal study. In this sample, 35% of participants had experienced corporal punishment at age 11, 29% had experienced corporal punishment at age 13 and 24% had experienced corporal punishment at the age of 15. The levels of corporal punishment and declining trends in experiences of corporal punishment is in line with previous research which found prevalence rates of 33% at age 14 and 13% at age 17 (Straus & Stewart, 1999; Harper et al., 2006). When looking at gender comparisons, it was found that, typically, males experienced corporal punishment more frequently than females at ages 11 and 13; however, at age 15 the prevalence of corporal punishment was almost identical. These findings are in line with previous research (Straus & Stewart, 1999; Taylor, Lee, Guterman & Rice, 2010) who found that it is often the case that the frequency of spanking is higher for boys than for girls. In the current study, within the correlational analyses, significant gender differences were found at ages 11 and 13, with males being more likely to report experiences of corporal punishment; however, no significant correlation between corporal punishment and gender was found at age 15 which is expected given the degree of similarity in their prevalence rates. Due to previous research using different measures, definitions and time frames, it is difficult to directly compare rates of corporal punishment to other studies. Regardless, these prevalence rates indicate that this sample has experienced corporal punishment enough to be included in this study.

Corporal Punishment Associated with Increased Aggression. The relation between corporal punishment and subsequent aggression has been widely researched (Gershoff, 2002). In this study, at the bivariate level, corporal punishment experienced at ages 11, 13 and 15 had a positive significant correlation with aggression at all ages. Higher levels of exposure to corporal punishment at age 11 was associated with higher levels of aggression at ages 11, 13 and 15. When examining multiple hierarchical regression analyses, results indicate that corporal punishment had a significant main effect when predicting aggression both within and across time points. With regards to corporal punishment experienced at age 11, significant main effects were

found when predicting aggression at ages 11, 13 and 15. This was also the case for age 13 corporal punishment; significant main effects were found when predicting age 13 and age 15 aggression. Finally, when examining corporal punishment experienced at age 15, as per the previous analyses, significant main effects were found when predicting age 15 aggression suggesting that higher levels of corporal punishment were linked to higher levels of aggression.

The autoregressive cross-lagged panel analysis showed evidence of a temporal relation between corporal punishment and subsequent aggression, such that in the main model, corporal punishment at age 11 had a significant main effect on aggression at age 15, even when controlling for stability in aggression. Although the beta values appear to be relatively low (β = .08, p<.05), it has been suggested that smaller effect sizes in autoregressive models could still be meaningful (Adachi & Willoughby, 2015). This is because autoregressive models control for past levels of the outcome variable (stability effects of aggression) in order to assess change in levels of the outcome variable (i.e. aggression) which can lead to a dramatic reduction in the association between the predictor and the outcome. The purpose of this is to ensure that any cross-lagged effect does not simply reflect the association between those two variables at the previous time point. The disadvantage of this is that by controlling for stability effects, a large portion of the variance in the outcome variable is removed. The strongest predictor of behavioural outcomes is often the previous level of these outcomes (i.e. measured from the previous year) (Adachi & Willoughby, 2015). Furthermore, Adachi and Willoughby (2015) found that controlling for stability effects in the outcome variable removes variance that is shared with the predictor (accounting for the correlation between corporal punishment at age 11 and aggression at age 11) and this 'suggests that the effect size of the predictor on change in the levels of the outcome at T2 will likely be small when there is at least moderate overlap between the predictor at T1 and the outcome at T1' (p.119).

Adachi and Willoughby (2015) state that in autoregressive longitudinal models, it is not possible to give a standard threshold to apply when examining the magnitude of the effect size. Instead, they suggest that other parameters must be examined in order to determine if the effect size is meaningful. For example, they suggest that 'a longitudinal effect size (controlling for stability in the outcome) of β = .07 is more likely to be meaningful if the bivariate correlation for this effect is much larger (e.g. r = .30) and the stability effect is large (e.g. β = .70; controlling for this stability effect greatly attenuates the longitudinal effect size from r = .30 to β = .07)' (Adachi & Willoughby, 2015, p.126). In the current study, it is argued that the main effect size between corporal

punishment at age 11 and aggression at age 15 (β = .08, p<.05) is meaningful given that the bivariate correlation between T1 predictor (Age 11 corporal punishment) and T1 outcome (age 11 aggression) is r = .32 (p<.05) and the stability effects are large ($\beta_{Age11-13}$ = .43, p<.05 and $\beta_{Age13-15}$ = .54, p<.05). Therefore, in this study I can report finding meaningful significant main effects between corporal punishment at age 11 and subsequent aggression at age 15 when controlling for stability effects. When differences between males and females were examined, the path between age 11 corporal punishment and age 15 aggression remained significant for males (β = .13, p<.05) but not for females. However, with regards to females, there was a significant main effect between corporal punishment at age 13 and aggression at age 15 (β = .13, p<.05) suggesting that higher exposure to corporal punishment results in higher levels of subsequent aggression at a later time point. This finding slightly contradicts previous studies (Deater-Deckard & Dodge, 1997; Lansford et al., 2004) who found corporal punishment to be significantly related to aggression for males but not females.

Interestingly, no significant main effect was found between corporal punishment experienced at age 11 and subsequent aggression at age 13 in the main analyses. One reason for the lack of this significant main effect could be due to the fact that at age 13, young people are still spending more time at home or around their family and may be faced with less opportunity to react aggressively. The frustration-aggression hypothesis suggests that aggression is triggered when an individual has a drive to end a state of frustration. It is sometimes the case that an individual will fear being punished for overt aggression which could lead to them supressing their frustration. Once the young person gets older and starts spending more time out of the home, they may see a reduced risk of being punished for overt aggression, and so are more likely to take out their frustration on someone other than the 'frustrater' (Krahé, 2001). Therefore, those who experience corporal punishment at age 11 might still have urges to react aggressively but supress those urges until they are away from the home. This also highlights a possible protective factor between the ages of 11 and 13. In order to supress the urge to respond to frustrations and react in an aggressive manner, one must have a degree of self-control. Thus, it could be the case that there is a protective factor that is present between age 11 corporal punishment and age 13 aggression which either weakens or disappears when the young person gets older. Further research into protective factors such as this is recommended.

Bidirectional Relations. The question about whether it is parents' corporal punishment that leads to children becoming more aggressive, or aggressive children eliciting more corporal punishment

from their parents has long been debated (Childs, Fite, Moore, Lochman, & Pardini, 2014; Garthe, Sullivan, & Larsen, 2015; Keijsers et al., 2011). The problem is that correlational studies are not always well suited to address issues of causality and few studies have tested whether bidirectional relations can be found across time-points (Lansford et al., 2011). There has been a smaller body of research that has considered child aggression as the predictor and corporal punishment as the outcome variable. This chapter examined not only main effects between corporal punishment and subsequent aggression, but also bidirectional relations between parents' use of corporal punishment and subsequent aggression. Hierarchical regressions were completed which considered child aggression as the predictor and corporal punishment as the outcome variable. With regards to age 11 aggression, there were significant main effects found when predicting corporal punishment at ages 11, 13 and 15. This was also the case with age 13 aggression predicting corporal punishment at ages 13 and 15, and age 15 aggression predicting concurrent corporal punishment at age 15. In the main autoregressive cross-lagged panel model, bidirectional effects were found. Results indicate that age 13 aggression significantly predicted age 15 corporal punishment ($\beta = .08$, $p<.05$) when controlling for stability effects. It is important to consider why there was no significant main effect between age 11 aggression and age 13 corporal punishment in the main model, when there was a significant main effect between age 13 aggression and age 15 corporal punishment. One reason for this could be that when a child grows older and continues to act in an aggressive manner, the parents' level of tolerance has been reduced which leads them to resort to responding to that aggressive behaviour with corporal punishment. It may also be the case that as the child grows older, they also grow physically larger which leads the parent to feel that it is more acceptable to use physical interventions to address the undesirable behaviour.

I did find evidence of gender differences in bidirectional relations between corporal punishment and aggression. For males, no bidirectional relation was found; however, for females, this study found that aggression levels at age 13 significantly predicted experiencing corporal punishment at age 15 ($\beta = .10$, $p<.05$). This finding could suggest that parents are more likely to respond with physical punishment to correct undesirable behaviour by girls rather than boys during adolescence. This finding contradicts previous research which found no gender difference with regards to bidirectional relations (Hipwell et al., 2008; Lansford et al., 2011; Pardini et al., 2008). With regards to the female model, in the case of corporal punishment, which parents typically use less frequently as their children enter adolescence, it may be that ongoing use of corporal punishment is less normative and thus it predicts subsequent increased aggression. By the time

the female is entering this stage of adolescence, parents who use corporal punishment may be a distinct group from those who do not (Lansford et al., 2011). Thus, at older ages, cycles of coercion between parents and children may play out in parenting behaviour, which is what then accounts for the use of corporal punishment at age 15 for those who are displaying aggressive behaviours at the age of 13.

The findings in this study are in line with previous models that suggest parental use of corporal punishment promotes children's aggression across time. Previous research has suggested that patterns of bidirectional associations between parenting and children's aggression could change across developmental periods (Scarr & McCartney, 1983). The current study contradicts previous research which has suggested that parent to child effects could become weaker over time while child to parent effects may become stronger over time (Vuchinich, Bank, & Patterson, 1992).

Conclusion

According to Fergusson and Lynskey (1997), a recommended way of examining the relation between corporal punishment and subsequent aggression is through a longitudinal study in which corporal punishment experiences were assessed throughout childhood, concurrently with measures of aggression. One strength of the current study is that I was able to examine associations between corporal punishment and subsequent aggression concurrently over the span of four years in adolescence. This study's finding, that corporal punishment had main effects on subsequent aggression four years later, as well as bidirectional associations between age 13 and 15 for females, highlights the importance of investigating corporal punishment as both a predictor and an outcome, and considering how they are related over the course of different developmental phases in adolescence.

This study has implications for theory, methods and interventions. These findings support theoretical models that suggest corporal punishment can lead to increased aggression such as social information processing theory and strain theory. This study also highlights the strength of using longitudinal methods and supports the argument that effect sizes in autoregressive longitudinal models need to be considered independently from traditional thresholds such as those provided by Cohen (1992). Because I found significant main effects between corporal punishment and aggression, and in some cases, aggression and corporal punishment, interventions should be directed towards children, parents, or both as a means to interrupt the cycles of parent-child coercion. Perhaps if parents are provided with help to develop the skills

needed to reduce the use of corporal punishment, this could help reduce the development of subsequent aggression. Similarly, if interventions focus on reducing the child's levels of aggression, this could potentially reduce the chances that a parent will administer corporal punishment. Addressing these two elements could have lasting effects which could ultimately diminish the coercive parent-child cycle.

Chapter 6: Self-control as an Interactive Protective Factor

Introduction

Research on childhood maltreatment has traditionally focused on the development of aggression and how this predicts future criminality. However, not everyone who experiences corporal punishment becomes aggressive. Understanding the mechanisms that differentiate those who are exposed to corporal punishment who do, versus do not, go on to develop aggression, may have implications for prevention. Thus, it is important to investigate potential interactive protective factors between corporal punishment and aggression. As discussed in Chapter 3, an interactive protective factor is a variable that predicts a low probability of an undesirable outcome in the presence of a specific risk factor when the protective factor is present. The following chapter investigates the role of self-control as an interactive protective factor between corporal punishment and aggression. Self-control would be evidenced as an interactive protective factor if individuals who recorded reduced levels of low self-control (protective factor) had lower levels of aggression, having experienced corporal punishment.

Self-control as a Protective Factor

One candidate protective factor is self-control. According to Tangney, Baumeister, & Boone (2004) self-control is the capacity to override or alter unwanted behavioural responses and refrain from acting on them. The relation between self-control and delinquent behaviour is explained by Gottfredson and Hirschi's (1990) General Theory of Crime. They argue that the causes of crime and deviance relate to an individual's level of self-control. More specifically, the higher the level of self-control that an individual has, the less likely they are to partake in criminal and deviant acts. This is because higher levels of self-control or self-regulation increase an individual's ability to delay gratification, control emotions and regulate their behaviour (Berger, Kofman, Livneh & Henik, 2007; Bronson, 2000; Barnes, Boutwell, Beaver, & Gibson, 2013). Previous research has found that individual levels of self-control emerge during the first years of life (Barnes et al., 2013; Vaughn, Kopp, & Krakow, 1984) and differences between individuals remain relatively stable over the life span. Gottfredson and Hirschi (1990) also argue that self-control develops early in childhood. Parents aid children in developing self-control by monitoring the child's behaviour, recognising undesirable behaviour and administering appropriate discipline when required. Self-control is therefore developed by the parents exercising social control (Gottfredson & Hirschi, 1990). As discussed in Chapter 2, some argue that the effective use of corporal punishment enhanced the efficiency of time outs and resulted in children listening to explanations of their

punishments (Larzelere & Kuhn, 2005). The ability for a child to be able to engage in time-out and productively listen to explanations of their punishments requires an element of self-regulation and self-control. It could be, perhaps, the case that children who react positively to corporal punishment in this way, already have well established levels of high self-control and self-regulation. This essentially acts as a protective factor and results in compliance and reduced oppositional or antisocial behaviours.

Studies have found that self-control and aggression are often strongly correlated (de Kemp et al., 2009; Keatley et al., 2017). Keatley et al. (2017) analysed the relation between self-control and aggression and found that, apart from hostility, all aggression measures were associated with implicit self-control with no difference being found between males and females. They also found that higher levels of self-control were associated with lower tendencies for aggression. With regards to explicit self-control, the relation between aggression and self-control was stronger for males and, apart from hostility, males were shown to have a higher level of aggression compared to females. Using structural equation modelling with a sample ranging from age 11 – 14 years, de Kemp et al. (2009) examined whether levels of self-control affected levels of aggression over time. Their SEM analyses found that higher levels of self-control were consistently associated with less aggressive and delinquent behaviours in subsequent six-month intervals. Their results also indicated that previous levels of aggression did not influence self-control.

It is possible to speculate on several ways in which self-control could reduce the effects of corporal punishment on adolescent aggression. Various studies have examined self-control when considering the relation between risk factors such as corporal punishment and later adolescent behaviours. For example, Kassis, Artz, Scambor, Scambor, and Moldenhauer (2013) examined protective factors for those exposed to family violence in a cross-sectional study with middle school students (mean age of 14.5). They found that personal and social characteristics such as high self-concept, higher emotional self-control and being able to talk about violence helped to protect against developing aggressive behaviours in adolescence. Furthermore, Vassallo et al. (2016) examined protective factors at ages 11-12, 13-14 and 15-16 between externalizing problem behaviours at age 11-12 and rates of fighting at ages 17-18 and 19-20. Their regression analyses indicated that higher levels of self-control at ages 11-12, 13-14 and 15-16 were associated with lower levels of fighting at age 17-18. When examining rates of fighting at age 19-20, high self-control at ages 13-14 and 15-16 were associated with lower rates of fighting. In subsequent multivariate analyses, at each timepoint, self-control was the only factor that was

consistently protective against fighting at ages 19-20 when all other protective factors were considered. Vassallo et al. (2016) also examined self-control as a 'risk modifier' or interactive protective factor which ameliorated the association between externalizing problems and violence. Self-control was not identified as an interactive protective factor between the risk of externalizing problems at ages 11-12 on fighting at age 17-18; however, self-control at age 15-16 and 19-20 was found to be a statistically significant interactive protective factor with regards to reduced fighting at 19-20 years. Their study is in line with previous research discussed in Chapter 3, which has also found that the effect of a protective factor can differ depending on the developmental stage of the adolescent.

When examining self-control as a potential interactive protective factor, is it important to consider possible gender differences. Gottfredson and Hirschi (1990) argue there are differences between male and female crime rates which are due to differences in the levels of self-control that males and females have. They argue that boys are often monitored less; therefore, girls develop higher levels of self-control. Jo and Bouffard (2014) used growth mixture modelling to test for gender differences in developmental patterns of self-control, and hierarchical linear modelling to examine gender differences in the relationships between social factors and self-control. Their results showed that gender differences in self-control persist over the short term but not over the long term. Female levels of self-control decreased consistently over a five-year period, while for males, self-control decreased at ages 10, 11 and 12, increased between ages 12 and 13, then decreased again between ages 13 and 14. They also found that males had significantly lower levels of self-control than females at ages 10, 11 and 12; however, the gender gap decreased and became non-significant at ages 13 and 14. Their study provides partial support for Gottfredson and Hirschi's (1990) arguments on gender differences in self-control, however further investigation is required to examine the inconsistency in gender differences.

The effect that self-control has as an interactive protective factor on males could be different than females and this difference could be important when developing intervention or prevention programmes. For example, Chang, Olson, Sameroff, and Sexton (2011) focused on whether parenting practices are associated with later externalizing behaviour problems in children. They considered whether effortful control, which they classed as the ability to inhibit actions through elements of self-control, mediated these effects. They identified gender differences which suggested that, for boys, low levels of warm responsiveness and frequent use of corporal punishment predicted high levels of externalising behaviours, which was mediated by deficits in

effortful control. However, for girls, effortful control was not a significant mediator of the effects of parenting on disruptive behaviour. This means that for boys, corporal punishment reduced levels of self-control, which resulted in higher levels of externalizing behaviours. However, for girls, self-control was not a mediator. Similar results were found by Evans et al. (2012). When examining self-control as a mediating mechanism between corporal punishment and delinquency, Evans et al. (2012) found that corporal punishment had an indirect effect through self-control on adolescent delinquency for males but not females. This suggests that corporal punishment reduced levels of self-control, which, in turn, resulted in increased levels of delinquency for males but not females. The differences mentioned above with regards to the effects of corporal punishment and self-control for males and females highlights the importance of considering gender separately when investigating interactive protective factors.

The Current Study

The purpose of the current study is to examine self-control as an interactive protective factor between corporal punishment and subsequent aggression. Although the general theory of crime (Gottfredson & Hirschi, 1990) is one of the most influential theoretical models in the development of antisocial behaviour and criminality, there is a lack in the number of empirical studies testing self-control as an interactive protective factor between corporal punishment and adolescent aggression. This study therefore tested the hypothesis that self-control moderates the association between corporal punishment and aggression in adolescence. Based on the above-outlined considerations, it was hypothesised that children with reduced levels of low self-control would be more protected against the adverse effects of corporal punishment, when considering later adolescent aggression. This study will also examine main effects and gender differences when considering the relation between corporal punishment, self-control and aggression.

Methods

Self-control was tested as an interactive protective factor between corporal punishment and both concurrent and subsequent aggression using autoregressive cross-lagged panel models estimated in Mplus 8 (Muthen & Muthen, 1998 – 2017). In addition to being able to examine the longitudinal effects of levels of one variable on changes in another (Hamaker et al., 2015) the cross-lagged panel model can also be used to test for interactive protective factors. In this study, an interactive protective factor is a factor that predicts a low probability of problem behaviour among a group of individuals exposed to a specific risk factor (Lösel & Farrington, 2012; Ttofi et

al., 2016; Andershed, Gibson & Andershed, 2016). In a cross-lagged panel model, an interactive protective factor would be a variable that moderates or attenuates the impact of corporal punishment (Lösel & Farrington, 2012). This study will also administer an autoregression within the cross-lagged panel analysis. This allows the model to control for past levels of aggression, experiences of corporal punishment and previous levels of self-control. More information about the analytical plan, including estimation methods, will be discussed below. Descriptive statistics, correlations and regressions were all run using IBM SPSS version 24.

The Self-control Scale

Self-control was measured using a scale derived from an adaptation of Grasmick, Tittle, Bursik, and Arneklev's (1993) 'Low self-control scale' (later modified by Longshore, Turner, & Stein, 1996) ($\alpha_{age\ 11}$ = .75, $\alpha_{age\ 13}$ = .78, α_{age15} = .75). Self-control was measured using a 10-item mean scale which incorporates five subdimensions of self-control: impulsivity (e.g. I often act on the spur of the moment without stopping to think), self-centeredness (e.g. I will try to get the things I want even when I know it's causing a problem for other people), risk-seeking (e.g. Sometimes I will take risks just for the fun of it), volatile temper (e.g. If I don't get something I want immediately, I get angry pretty quickly) and preference for physical over cognitive or verbal activities (e.g. If I had a choice, I would almost always rather do something physical than something mental). This is the most widespread attitudinal measure of self-control in Criminology (Ribeaud & Eisner, 2006). Responses were coded on a 4-point scale from false, to true (higher scores reflect *lower* levels of self-control) (see Ribeaud & Eisner, 2006).

The Analytic Plan

As the empirical chapters are design to stand alone, the analytic plan for each follows a relatively similar overall structure. In this chapter, similar to chapter 5, I began by examining associations between corporal punishment, low self-control and adolescent aggression. However, in this chapter, I wanted to examine a potential interactive protective factor and assess whether reduced levels of low self-control would predict lower levels of aggression. As a reminder, the measure of self-control represents 'low self-control', thus, higher scores on the self-control measure actually represent lower self-control. It is important to note that my measure of self-control does not include elements of 'high' self-control. Because of this, terminology such as 'reduced levels of low self-control' will be used to reflect 'higher' levels of self-control. Once I finished examining the associations between corporal punishment, self-control and aggression, I then examined the

hypothesis that self-control would act as an interactive protective factor between corporal punishment and aggression. Finally, the above was split by gender to ascertain if there were any differences in the protective capabilities of self-control for males and females.

Descriptive and Inferential Statistics

The first step in building the model to test for interactive protective factors was to examine descriptive and inferential statistics and illustrate levels of self-control in the sample. Details regarding experiences of corporal punishment and levels of aggression are included in Chapter 5 and additional information regarding sample background characteristics are referred to in Chapter 4. Correlations between corporal punishment, self-control and aggression within time points and across time points were examined, followed by regression analyses and autoregressive cross-lagged panel analyses.

Hierarchical Regression

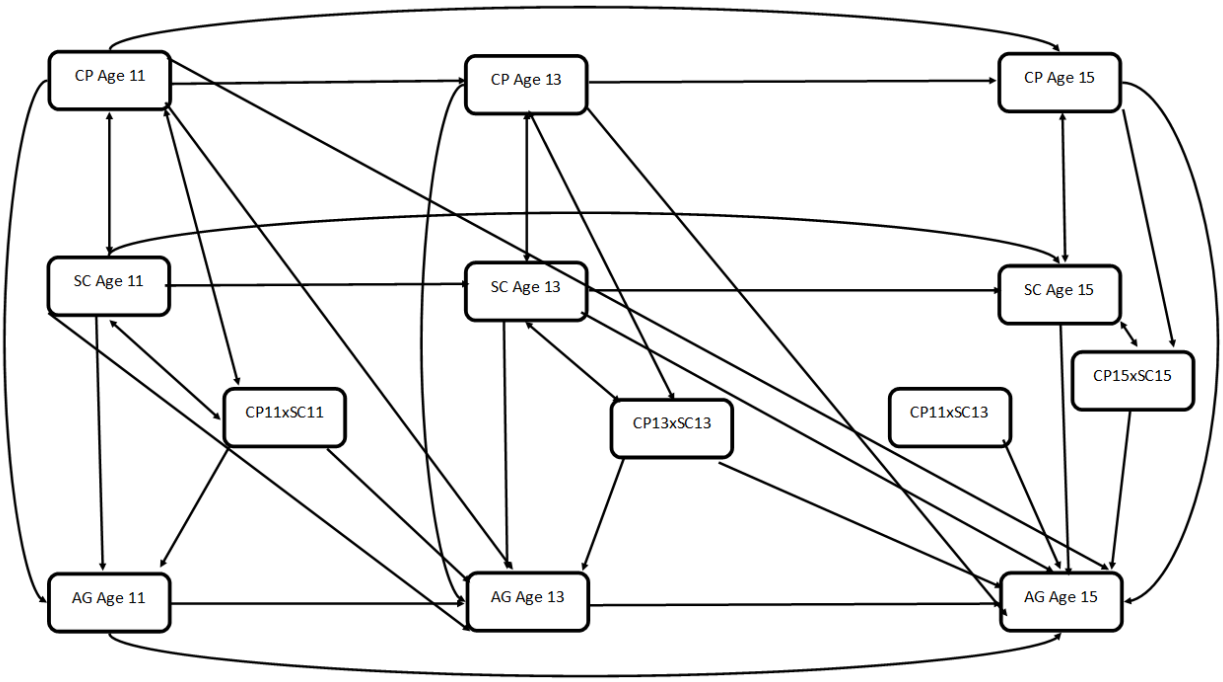
Following correlational analysis, hierarchical multiple regression analyses were completed to examine low self-control as a predictor of aggression within and across time points. As discussed in Chapter 5, the hierarchical multiple regression analyses included adding variables within a series of steps. The change in *R* is calculated and evaluated to see if the change is significantly different from zero. This allows the researcher to determine whether the inclusion of predictor variables improved the prediction of the outcome variable. For each step, β are calculated to determine the relative contribution of each variable in predicting the outcome variable. In all regressions, gender and socioeconomic status were entered into the regression first. Corporal punishment was added in the second step of the regression, and self-control was added to the third step of the regression. The first group of hierarchical regressions were testing whether age 11 self-control predicted subsequent aggression at ages 11, 13 and 15, while controlling for gender, socioeconomic status and corporal punishment. The second group of hierarchical regressions were testing self-control at age 13 as a predictor of aggression at age 13 and 15. The third group of hierarchical regressions included age 15 self-control as a predictor of age 15 aggression. All regressions were repeated using the teacher-child aggression outcome measure for comparative purposes.

Autoregressive Cross-lagged Panel Model

Based on a combination of previous research and Gottfredson & Hirschi's assertion that low self-control results in antisocial behaviour, I hypothesised that levels of aggression would be higher amongst those exposed to corporal punishment who had low self-control. Previous research has also found that the stage of development can impact the protective effect of variables and the negative effect of risk factors. For example, levels of self-control were found to fluctuate between early adolescence and late adolescence. Furthermore, the impact of corporal punishment can differ depending on the stage of adolescence due to increase time spent away from the home when the young person gets older. Thus, taking these factors into account, an autoregressive cross-lagged panel model was fit which examined self-control as an interactive protective factor between corporal punishment and aggression, while also controlling for stability of aggression, self-control and corporal punishment (Figure 8). To test self-control as an interactive protective factor within waves and across waves, all predictor variables (corporal punishment and low self-control) were first centred before being entered into the model. Using the centred variables, product terms were created by multiplying the two predictor variables together, then used to test interaction effects. Models were then split by gender as a means to examine any gender differences that self-control may have as an interactive protective factor between corporal punishment and subsequent aggression.

Variable scores for low self-control, corporal punishment and adolescent aggression were all based on longitudinal data. Therefore, similar to Chapter 5, to account for stability of self-control, aggression and corporal punishment, the cross-lagged panel model included an autoregression. MLR was used for parameter estimations to account for data missingness and skewness when testing for interactions. Model fit was evaluated using the CFI, the TLI and the RMSEA. Good fit was achieved for CFI values >.95, TLI values >.95 and for RMSEA values <.06 (Bentler, 1990). As the chi-square tends to over-reject true models for large samples, it was not used in the evaluation of model fit (Bentler, 1990). As is the case with all empirical analyses in this thesis, standardized regressions, coefficients and betas are presented throughout which may be interpreted as indicators of relative effect size. Using standardized regression coefficient results from the autoregressive cross-lagged panel model, simple slopes were created as a visual representation of significant interaction effects.

Figure 8 Autoregressive Cross-lagged Panel Model Testing for Interactions



Note. AG = Aggression. CP = Corporal Punishment. SC = Low Self-control. Lines with one arrow represent regression paths. Lines with two arrows represent correlational paths.

Results: Low Self-control

Descriptive Statistics: Low Self-Control

The general estimates of levels of low self-control across the three timepoints are displayed in Table 23. Self-reported measures of self-control showed relatively similar levels of low self-control with a slight increase from ages 11 to 15 for the full sample (M_{age11} = 1.95, *SD* = .48; M_{age13} = 2.21, *SD* = .48; M_{age15} = 2.27, *SD* = .43). As this is a measure of low self-control, higher scores indicate higher levels of low self-control. When considering gender differences, the results show that males had slightly higher mean levels of low self-control when compared to females during this stage of adolescent development.

Table 23 Low Self-Control Descriptive Statistics

	N	*M*	*SD*	Range	Skewness	Kurtosis
Low Self-Control						
Age 11	**1146**	**1.95**	**0.48**	**1-4**	**.44**	**.13**
Males	583	2.02				
Females	563	1.87				
Age 13	**1358**	**2.21**	**0.48**	**1-4**	**.20**	**.19**
Males	701	2.26				
Females	657	2.13				
Age 15	**1444**	**2.27**	**0.43**	**1-4**	**.25**	**.51**
Males	748	2.32				
Females	696	2.23				

Correlations: Self-Control

The results that illustrate associations between corporal punishment experienced at different time points were presented in Chapter 5. Higher levels of corporal punishment at one time point was significantly associated with higher levels of corporal punishment at all other time points (Table 24). Moreover, significant gender differences were found at ages 11 and 13 (but not age 15), with males reporting higher levels of corporal punishment than females. Both self-reported and teacher-reported measures of aggression had moderate to strong correlations across all time points (Table 24). Furthermore, males were more likely to report higher levels of aggression when compared to females. Correlations also show significant positive associations between corporal punishment and self-reported aggression across all time points. Similar results were found for the teacher-child combined aggression measure.

When considering levels of low self-control across time points, results show that corporal punishment experienced at age 11 had a positive significant correlation with self-control at age 11 (r = .19, p<.05), age 13 (r = .06, p<.05) and age 15 (r = .07, p<.05). Corporal punishment experienced at age 13 had a significant correlation with low self-control at age 13 (r = .18, p<.05) and age 15 (r = .10, p<.05) but not age 11. Similarly, corporal punishment experienced at age 15 had a significant correlation with self-control at age 13 (r = .09, p<.05) and age 15 (r = .18, p<.05) but not age 11.

Associations between low self-control and adolescent aggression were examined. Results show that age 11 aggression had a significant correlation with age 11 self-control (r = .54, p<.05), age 13 self-control (r = .31, p<.05) and age 15 self-control (r = .24, p<.05). Similar results were found with regards to age 13 aggression and self-control (r_{age11} = .28, p<.05; r_{age13} = .52, p<.05; r_{age15} =

.35, $p<.05$) and age 15 aggression and self-control ($r_{age11} = .23$, $p<.05$; $r_{age13} = .36$, $p<.05$; $r_{age15} = .50$, $p<.05$). Correlation results indicate that increased levels of low self-control were associated with increased levels of aggression, with the strongest correlation being found within the same time points. Similar results were found when considering the teacher-child aggression measure. When looking at correlations between self-control and gender, results indicated a negative significant correlation at age 11 ($r = -.16$, $p<.05$), age 13 ($r = -.14$, $p<.05$) and age 15 ($r = -.10$, $p<.05$), which supports research discussed previously which suggested that males had higher levels of low self-control when compared to females.

Table 24 Correlations with Self-Control, Aggression and Corporal Punishment

	1	2	3	4	5	6	7	8	9	10	11	12
Gender	-.09**	-.07**	.01	-.25**	-.27**	-.23**	-.28**	-.28**	-.24**	-.16**	-.14**	-.10**
Corporal Punishment												
1. Age 11		.33**	.25**	.32**	.17**	.17**	.28**	.21**	.17**	.19**	.06*	.07*
2. Age 13			.41**	.12**	.28**	.21**	.16**	.29**	.19**	.06	.18**	.10**
3. Age 15				.09**	.16**	.28**	.10**	.16**	.24**	.04	.09**	.18**
Aggression												
4. Age 11					.43**	.34**	.82**	.41**	.34**	.54**	.31**	.24**
5. Age 13						.55**	.47**	.83**	.52**	.28**	.52**	.35**
6. Age 15							.38**	.52**	.81**	.23**	.36**	.50**
Teacher-Child Reported Aggression												
7. Age 11								.54**	.43**	.45**	.33**	.26**
8. Age 13									.61**	.27**	.48**	.35**
9. Age 15										.20**	.35**	.46**
Self-Control												
10. Age 11											.44**	.32**
11. Age 13												.50**
12. Age 15												

Note. ** $p<.01$.

Regressions: Self-Control

Hierarchical regression analyses which examined the effect of corporal punishment on aggression were reported in Chapter 5. In this chapter, similar analyses were used, however, with the addition of self-control. In this section, hierarchical regressions were used to assess whether self-control predicted aggression both within and across time points. As was the case in the previous chapter, outcome measures included both self-reported aggression and, in separate analyses, teacher-child reported aggression as a means of comparison. Control variables (gender and socioeconomic status) were entered first, with corporal punishment being entered into the second step. Finally, self-control was entered into the third step of the group of analyses. Across the empirical chapters, sections describing the results will be structured in a similar way.

Age 11 Self-Control Predicting Aggression. Table 25 displays the results of the separate regression analyses of age 11 self-control predicting aggression within and across time points. In the first step of the group of models, gender significantly predicted self-reported aggression at age 11 (β = -.24, p<.05), age 13 (β = -.28, p<.05) and age 15 (β = -.22, p<.05) and socioeconomic status predicted self-reported aggression at age 13 (β = -.12, p<.05) and age 15 (β = -.14, p<.05) significantly, but not age 11 (β = -.01, p>.05; Step 1: $R^2_{\text{Age 11}}$ = .06; $R^2_{\text{Age 13}}$ = .09; $R^2_{\text{Age 15}}$ = .07). In the second step, corporal punishment experienced at age 11 was added to the regressions. There were significant main effects for age 11 corporal punishment and age 11 aggression with higher levels of corporal punishment linked to higher levels of aggression (β = .31, p<.05). When age 11 corporal punishment was included in the regression, the amount of variance explained increased by 9% (R^2 = .15). In the second group of analyses, the effect of age 11 corporal punishment on age 13 aggression was examined. There were significant main effects for age 11 corporal punishment and age 13 aggression with higher levels of corporal punishment linked to higher levels of aggression (β = .16, p<.05). When age 11 corporal punishment was included in the regression, the amount of variance explained increased by 2% (R^2 = .11). In the third group of analyses, the effect of age 11 corporal punishment on age 15 aggression was examined. There were significant main effects for age 11 corporal punishment and age 15 aggression with higher levels of corporal punishment linked to higher levels of aggression (β = .16, p<.05). When age 11 corporal punishment was included in the regression, the amount of variance explained increased by 2% (R^2 = .09).

In the third step of the group of models, age 11 self-control was added. There were significant main effects for age 11 self-control and age 11 aggression with higher levels of low self-control

linked to higher levels of aggression (β = .49, p<.05). When age 11 self-control was included in the regression, the amount of variance explained increased by 22% (R^2 = .37). In the second group of analyses, the effect of age 11 self-control on age 13 aggression was examined. There were significant main effects for age 11 self-control and age 13 aggression with higher levels of low self-control linked to higher levels of aggression (β = .26, p<.05). When age 11 self-control was included in the regression, the amount of variance explained increased by 7% (R^2 = .18). In the third group of analyses, the effect of age 11 self-control on age 15 aggression was examined. There were significant main effects for age 11 self-control and age 15 aggression with higher levels of low self-control linked to higher levels of aggression (β = .19, p<.05). When age 11 self-control was included in the regression, the amount of variance explained increased by 3% (R^2 = .12).

Age 13 Self-Control Predicting Aggression. Table 27 shows the results of the separate regression analyses of age 13 self-control predicting subsequent aggression at age 13 and age 15. In the first step of the group of models, gender significantly predicted self-reported aggression at age 13 (β = -.27, p<.05) and 15 (β = -.22, p<.05), and socioeconomic status predicted self-reported aggression at age 13 (β = -.13, p<.05) and age 15 (β = -.15, p<.05; Step 1: $R^2_{\text{Age 13}}$ = .09; $R^2_{\text{Age 15}}$ = .07). In the second step, corporal punishment experienced at age 13 was added to the regressions. There were significant main effects for age 13 corporal punishment and age 13 aggression with higher levels of corporal punishment linked to higher levels of aggression (β = .27, p<.05). When age 13 corporal punishment was included in the regression, the amount of variance explained increased by 7% (R^2 = .16). In the second group of analyses, the effect of age 13 corporal punishment on age 15 aggression was examined. There were significant main effects for age 13 corporal punishment and age 15 aggression with higher levels of corporal punishment linked to higher levels of aggression (β = .19, p<.05). When age 13 corporal punishment was included in the regression, the amount of variance explained increased by 3% (R^2 = .10). In the third step of the regression, age 13 self-control was added. There were significant main effects for age 13 self-control and age 13 aggression with higher levels of low self-control linked to higher levels of aggression (β = .46, p<.05). When age 13 self-control was included in the regression, the amount of variance explained increased by 21% (R^2 = .37). In the second group of analyses, the effect of age 13 self-control on age 15 aggression was examined. There were significant main effects for age 13 self-control and age 15 aggression with higher levels of low self-control linked to higher levels of aggression (β = .32, p<.05). When age 13 self-control was included in the regression, the amount of variance explained increased by 10% (R^2 = .20).

Age 15 Self-control Predicting Aggression. Table 29 shows the results of the separate regression analysis of age 15 self-control predicting aggression at age 15. In the first step of the model, gender significantly predicted self-reported aggression at 15 (β = -.22, p<.05) and socioeconomic status predicted self-reported aggression at age 15 (β = -.15, p<.05; Step 1: R^2 = .07). In the second step, corporal punishment experienced at age 15 was added to the regressions. There were significant main effects for age 15 corporal punishment and age 15 aggression with higher levels of corporal punishment linked to higher levels of aggression (β = .30, p<.05). When age 15 corporal punishment was included in the regression, the amount of variance explained increased by 9% (R^2 = .16). In the third step, age 15 self-control was added to the regression. There were significant main effects for age 15 self-control and age 15 aggression with higher levels of low self-control linked to higher levels of aggression (β = .44, p<.05). When age 15 self-control was included in the regression, the amount of variance explained increased by 18% (R^2 = .34).

Table 25 Hierarchical Regression Analysis for Age 11 Self-Control Predicting Self-Reported Aggression at Age 11, 13 and 15, with 95% CI Reported in Parentheses.

	Age 11 Aggression n= 1043				Age 13 Aggression n = 941				Age 15 Aggression n = 992			
	b	SE(*b*)	β		*b*	SE(*b*)	β		*b*	SE(*b*)	β	
Step 1:												
Constant	1.86 (1.75, 1.96)	.05			2.39 (2.25, 2.54)	.07			2.21 (2.07, 2.34)	.07		
Gender	-.21 (-.26, -.16)	.03	-.24***		-.33 (-.40, -.25)	.04	-.28***		-.24 (-.30, -.17)	.03	-.22***	
SES	.01 (-.01, .01)	.01	-.01		-.01 (-.01, -.01)	.01	-.12***		-.01 (-.01, -.01)	.01	-.14***	
R^2				.06				.09				.07
△F				30.33***				46.05***				34.39***
Step 2:												
Constant	1.40 (1.26, 1.52)	.07			2.08 (1.89, 2.27)	.10			1.91 (1.74, 2.08)	.09		
Gender	-.18 (-.23, -.13)	.03	-.21***		-.31 (-.38, -.24)	.04	-.26***		-.22 (-.29, -.16)	.03	-.20***	
SES	.01 (-.01, .01)	.01	.02		-.01 (-.01, -.01)	.01	-.11**		-.01 (-.01, -.01)	.01	-.12***	
CP Age 11	.33 (.27, .39)	.03	.31***		.22 (.13, .30)	.04	.16***		.21 (.13, .28)	.04	.16***	
R^2				.15				.11				.09
△F				114.50***				24.90***				27.38***
Step 3:												
Constant	.60 (.46, .74)	.07			1.50 (1.27, 1.73)	.12			1.52 (1.31, 1.73)	.12		
Gender	-.12 (-.17, -.08)	.02	-.14***		-.26 (-.33, -.19)	.04	-.22***		-.19 (-.26, -.13)	.03	-.17***	
SES	-.01 (-.01, .01)	.01	-.02		-.01 (-.01, -.01)	.01	-.13***		-.01 (-.01, -.01)	.01	-.14***	
CP Age 11	.23 (.18, .28)	03	.22***		.15 (.07, .23)	.04	.11***		.162 (.08, .24)	.04	.13***	
SC Age 11	.45 (.40, .49)	.02	.49***		.32 (.25, .40)	.04	.26***		.218 (.15, .29)	.04	.19***	
R^2				.37				.18				.12
△F				363.17***				70.04***				37.01***

Note. **p*<.05. ***p*<.01. ****p*<.001. CP = Corporal Punishment. SES = Socioeconomic Status. SC = Self-Control.

Table 26 Hierarchical Regression Analysis for Age 11 Self-Control Predicting Teacher-Child Reported Aggression at Age 11, 13 And 15, with 95% CI Reported in Parentheses.

	Age 11 Aggression				Age 13 Aggression				Age 15 Aggression			
	n= 948				n = 867				n = 875			
	b	SE(*b*)	β		*b*	SE(*b*)	β		*b*	SE(*b*)	β	
Step 1												
Constant	.79 (.58, .99)	.10			1.01 (.81, 1.21)	.10			.88 (.68, 1.08)	.10		
Gender	-.45 (-.55, -.35)	.05	-.28***		-.47 (-.57, -.37)	.05	-.30***		-.37 (-.47, -.27)	.05	-.24***	
SES	-.01 (-.01, .00)	.01	-.06		-.01 (-.01, -.01)	.01	-.17***		-.01 (-.01, -.01)	.01	-.19***	
R^2				.08				.12				.09
△F				40.20***				56.58***				42.21***
Step 2:												
Constant	.01 (-.26, .27)	.14			.48 (.22, .74)	.13			.44 (.17, .70)	.14		
Gender	-.41 (-.51, -.31)	.05	-.25***		-.43 (-.53, -.34)	.05	-.28***		-.34 (-.44, -.25)	.05	-.22***	
SES	-.01 (-.01, .01)	.01	-.03		-.01 (-.01, -.01)	.01	-.15***		-.01 (-.01, -.01)	.01	-.18***	
CP Age 11	.54 (.41, .66)	.06	.26***		.36 (.25, .47)	.06	.20***		.31 (.19, .44)	.06	.16***	
R^2				.15				.15				.11
△F				74.86***				38.26***				24.90***
Step 3:												
Constant	-1.24 (-1.54, -.95)	.15			-.21 (-.53, .10)	.16			-.07 (-.40, .25)	.17		
Gender	-.31 (-.40, -.22)	.05	-.19***		-.38 (-.47, -.28)	.05	-.24***		-.30 (-.40, -.20)	.05	-.19***	
SES	-.01 (-.01, -.01)	.01	-.07*		-.01 (-.01, -.01)	.01	-.17***		-.01 (-.01, -.01)	.01	-.20***	
CP Age 11	.39 (.28, .51)	.057	.19***		.29 (.17, .40)	.06	.16		.26 (.14, .39)	.06	.14***	
SC Age 11	.69 (.60, .79)	.05	.41***		.38 (.28, .48)	.05	.23		.28 (.18, .39)	.05	.17***	
R^2				.31				.20				.14
△F				209.09***				52.11***				27.33***

Note. **p*<.05. ***p*<.01. ****p*<.001 CP = Corporal Punishment. SES = Socioeconomic Status. SC = Self-Control.

Table 27 Hierarchical Regression Analysis for Age 13 Self-Control Predicting Self-Reported Aggression at Age 13 and 15, with 95% CI Reported in Parentheses.

	Age 13 Aggression				Age 15 Aggression			
	n = 1034				n = 1010			
	b	SE(*b*)	β		*b*	SE(*b*)	β	
Step 1								
Constant	2.41	.07			2.24	.07		
	(2.27, 2.56)				(2.10, 2.37)			
Gender	-.32	.04	-.27***		-.24	.03	-.22***	
	(-.39, -.25)				(-.31, -.17)			
SES	-.004	.01	-.13***		-.01	.01	-.15***	
	(-.01, -.01)				(-.01, -.01)			
R^2				.09				.07
△F				48.80***				36.67***
Step 2:								
Constant	1.89	.09			1.89	.09		
	(1.71, 2.06)				(1.72, 2.06)			
Gender	-.29	.03	-.25***		-.22	.03	-.20***	
	(-.36, -.23)				(-.29, -.16)			
SES	-.01	.01	-.11***		-.01	.00	-.14***	
	(-.01, -.01)				(-.01, -.01)			
CP	.39	.04	.27***		.26	.04	.19***	
Age 13	(.31, .48)				(.18, .35)			
R^2				.16				.10
△F				89.39***				39.21***
Step 3:								
Constant	.65	.10			1.06	.11		
	(.45, .85)				(.85, 1.28)			
Gender	-.23	.03	-.19***		-.18	.03	-.16***	
	(-.29, -.17)				(-.24, -.12)			
SES	.004	.00	-.12***		-.01	.00	-.15***	
	(-.01, -.001				(-.01, -.01)			
CP	.28	.04	.19***		.21	.04	.15***	
Age 13	(.21, .35)				(.13, .28)			
SC	.59	.03	.46***		.38	.03	.32***	
Age 13	(.52, .65)				(.31, .45)			
R^2				.37				.20
△F				332.31***				124.63***

Note. *p<.05. **p<.01. ***p<.001 CP = Corporal Punishment. SES = Socioeconomic Status. SC = Self-Control.

Table 28 Hierarchical Regression Analysis for Age 13 Self-Control Predicting Teacher-Child Aggression at Age 13 and 15, with 95% CI Reported in Parentheses.

	Age 13 Aggression				Age 15 Aggression			
	n = 949				n = 887			
	b	SE(*b*)	β		*b*	SE(*b*)	β	
Step 1								
Constant	1.06 (.86, 1.26)	.10			.91 (.71, 1.12)	.10		
Gender	-.47 (-.56, -.37)	.05	-.29***		-.38 (-.48, -.29)	.05	-.24***	
SES	-.01 (-.01, -.01)	.01	-.18***		-.01 (-.01, -.01)	.00	-.19***	
R^2				.11				.09
△F				61.02***				44.39***
Step 2:								
Constant	.33 (.10, .59)	.13			.47 (.21, .73)	.13		
Gender	-.42 (-.52, -.33)	.05	-.26***		-.36 (-.46, -.26)	.05	-.23***	
SES	-.01 (-.01, -.01)	.01	-.17***		-.01 (-.01, -.01)	.00	-.18***	
CP Age 13	.52 (.40, .63)	.06	.27***		.33 (.20, .45)	.06	.16***	
R^2				.18				.12
△F				81.02***				26.65***
Step 3:								
Constant	-1.08 (-1.37, -.79)	.15			-.62 (-.95, -.29)	.17		
Gender	-.35 (-.43, -.26)	.04	-.22***		-.30 (-.40, -.21)	.05	-.19***	
SES	-.01 (-.01, -.01)	.01	-.17***		-.01 (-.01, -.01)	.01	-.18***	
CP Age 13	.38 (.27, .48)	.05	.19***		.23 (.11, .35)	.06	.12***	
SC Age 13	.67 (.58, .76)	.05	.40***		.51 (.41, .61)	.05	.30***	
R^2				.34				.21
△F				216.44***				97.19***

Note. *p<.05. **p<.01. ***p<.001 CP = Corporal Punishment. SES = Socioeconomic Status. SC = Self-Control.

Table 29 Hierarchical Regression Analysis for Age 15 Self-Control Predicting Self-Reported Aggression at Age 15, with 95% CI Reported in Parentheses.

	Age 15 Aggression			
	n = 1126			
	b	SE(*b*)	β	
Step 1				
Constant	2.23 (2.11, 2.36)	.06		
Gender	-.24 (-.30, -.18)	.03	-.22***	
SES	-.01 (-.01, -.01)	.01	-.15***	
R^2				.07
△F				40.81***
Step 2:				
Constant	1.65 (1.49, 1.81)	.08		
Gender	-.24 (-.30, -.18)	.03	-.22***	
SES	-.01 (-.01, -.01)	.01	-.12***	
CP	.46 (.38, .55)	.04	.30***	
Age 15				
R^2				.16
△F				117.26***
Step 3:				
Constant	.43 (.231, .62)	.10		
Gender	-.19 (-.24, -.14)	.03	-.17***	
SES	-.01 (-.01, -.01)	.01	-.10***	
CP	.34 (.26, .41)	.04	.22***	
Age 15				
SC Age 15	.56 (.50, .62)	.03	.44***	
R^2				.34
△F				317.58***

Note. *p<.05. **p<.01. ***p<.001 CP = Corporal Punishment. SES = Socioeconomic Status. SC = Self-Control.

Table 30 Hierarchical Regression Analysis for Age 15 Self-Control Predicting Teacher-Child Reported Aggression at Age 15, with 95% CI Reported in Parentheses.

	Age 15 Aggression			
	n = 988			
	b	SE(*b*)	β	
Step 1				
Constant	.92 (.73, 1.11)	.10		
Gender	-.38 (-.48, -.29)	.05	-.24***	
SES	-.01 (-.01, -.01)	.01	-.19***	
R^2				.09
△F				49.82***
Step 2:				
Constant	.28 (.03, .52)	.13		
Gender	-.38 (-.47, -.29)	.05	-.24***	
SES	-.01 (-.01, -.01)	.01	-.16***	
CP Age 15	.51 (.38, .64)	.07	.23***	
R^2				.15
△F				61.90***
Step 3:				
Constant	-1.28 (-1.58, -.97)	.16		
Gender	-.31 (-.39, -.23)	.04	-.20***	
SES	-.01 (-.01, -.01)	.01	-.15***	
CP Age 15	.33 (.21, .45)	.06	.15***	
SC Age 15	.72 (.62, .82)	.05	.40***	
R^2				.30
△F				210.70***

Note. *p<.05. **p<.01. ***p<.001 CP = Corporal Punishment. SES = Socioeconomic Status. SC = Self-Control.

Autoregressive Cross-Lagged Panel Model Results: Self-control

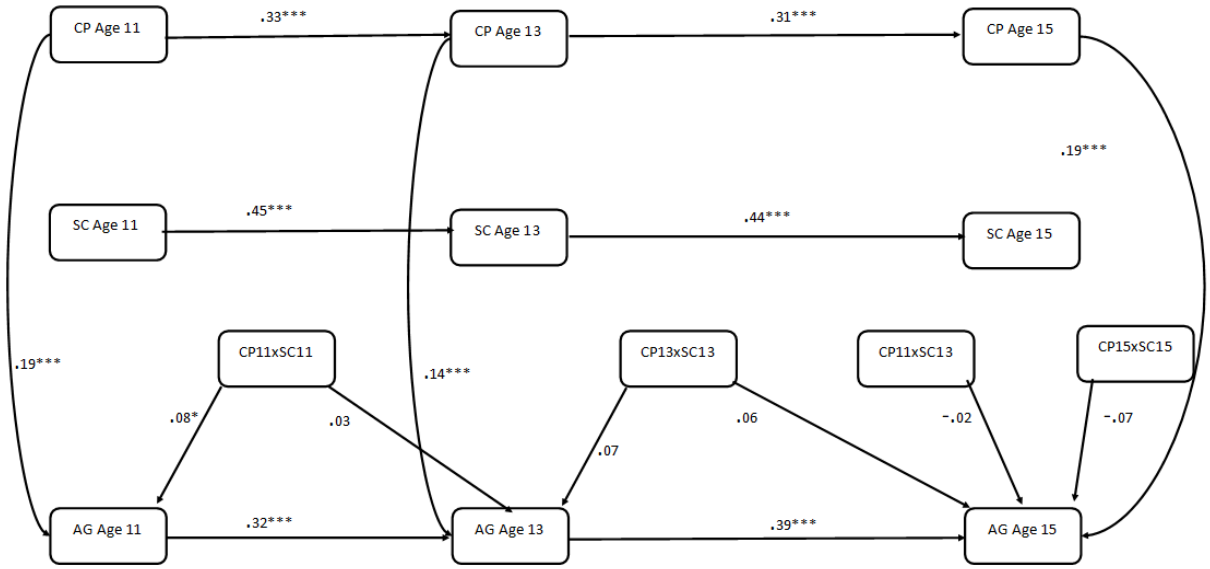
To test self-control as an interactive protective factor, I specified the autoregressive cross-lagged panel model presented in Figure 8. To test whether or not self-control acted as an interactive protective factor within waves and across waves, all predictor variables were first centred before being entered into the model. Using the centred variables, product terms were created and used to test interaction effects. The first model did not result in a good fit to the data, $X^2(36) = 239.13$, p<.05, RMSEA = .07, 90% CI [0.07, 0.08], CFI = .88, TLI = .78. Modification indices were examined, and the largest recommended correlational path was added to the model (age 11 corporal punishment x age 13 self-control product term correlated with age 11 corporal punishment x age 11 self-control). The addition of this path resulted in a good fit to the data, $X^2(31) = 67.69$, p<.05, RMSEA = .03, 90% CI [0.02, 0.04], CFI = .98 TLI = .97. Results of the final model are displayed in Figure 9 with only statistically significant paths relevant to moderation results displayed. All other results have been included in Table 31. Fully standardized parameter estimates indicate that inter-individual differences in corporal punishment ($\beta_{Age11\text{-}13} = .33$, $p<.05$ and $\beta_{Age13\text{-}15} = .31$, $p<.05$), self-control ($\beta_{Age11\text{-}13} = .45$, $p<.05$ and $\beta_{Age13\text{-}15} = .44$, $p<.05$) and aggression ($\beta_{Age11\text{-}13} = .32$, $p<.05$ and $\beta_{Age13\text{-}15} = .39$, $p<.05$) were stable over time. Main effects between self-control and aggression are displayed in Table 31. Results show that across all age groups within the full sample, self-control had a significant main effect with concurrent levels of aggression. This demonstrates that reduced levels of low self-control (i.e. higher levels of self-control) acted as a direct protective factor against concurrent levels of aggression. As discussed in Chapter 3, a direct protective factor is a variable that refers to the main effect of a variable and predicts a low probability of a problem behaviour (Lösel & Farrington, 2012; Ttofi, Farrington, Piquero, & DeLisi, 2016).

First, self-control was tested as an interactive protective factor within the same timepoint. Age 11 self-control was tested as an interactive protective factor between age 11 corporal punishment and age 11 aggression. Results indicated that self-control at age 11 was a significant interactive protective factor between age 11 corporal punishment and age 11 aggression ($\beta = .08$, $p<.05$). This suggests that lower levels of low self-control protected against the main effects of corporal punishment. Simple slopes calculated based on the standardized regression coefficients aided the interpretation of the significant interaction identified between age 11 self-control, corporal punishment and aggression. As shown in Figure 10, simple slopes indicated that those with lower levels of low self-control (-1 *SD*) also had lower levels of aggression after being exposed to corporal punishment. The simple slope results also show that amongst those exposed to higher

levels of corporal punishment, low self-control resulted in higher levels of aggression. When examining other timepoints, results show that age 13 self-control was not a significant interactive protective factor between age 13 corporal punishment and age 13 aggression (β = .07, *p*>.05). Similarly, age 15 self-control was not a significant interactive protective factor between age 15 corporal punishment and age 15 aggression (β = -.07, *p* = .05).

When considering lagged effects, age 11 self-control was not a significant interactive protective factor between age 11 corporal punishment and age 13 aggression (β = .03, *p*>.05). Similarly, age 13 self-control was not a significant interactive protective factor between age 13 corporal punishment and age 15 aggression (β = .06, *p*>.05). To account for temporal order of variables, the model also examined whether or not self-control at age 13 acted as an interactive protective factor between corporal punishment at age 11 and aggression at age 15. The results indicated there was no significant interaction effect for the full sample (β = -.02, *p*>.05).

Figure 9 Autoregressive Cross-Lagged Panel Model Testing Self-Control as an Interactive Protective Factor Between Corporal Punishment and Aggression.



Note. *p<.05, **p<.01, ***p<.001. AG = Aggression. SC = Self-control. CP= Corporal Punishment. Lines represent regression paths.

Figure 10 Simple Slopes Showing the Association between Age 11 Corporal Punishment and Age 11 Aggression at High (+1 *SD*) Medium (centred mean) and Low (-1 *SD*) Levels of Low Self-Control for the Full Sample.

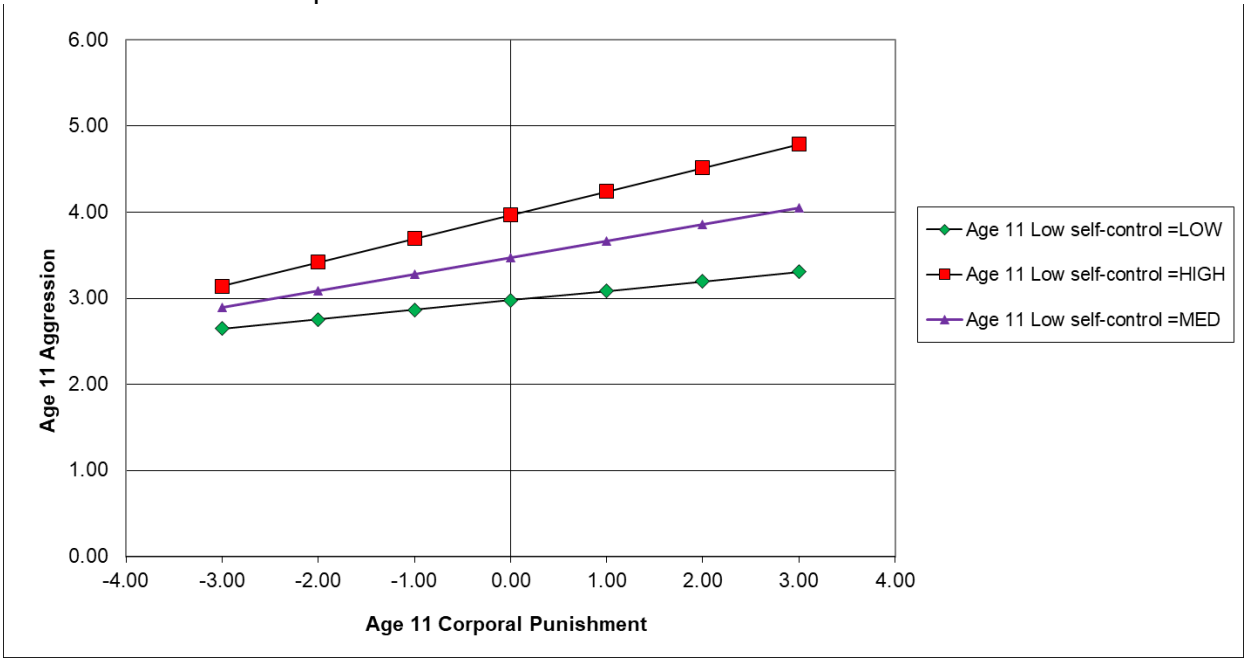


Table 31: Path Results of Autoregressive CLPM Testing Self-Control as an Interactive Protective Factor

	Estimate	*S.E.*	*Est./S.E.*	*Sig.*
Regression Paths				
Outcome Variable: Age 15 Aggression				
Age 13 Aggression	.392	0.033	12.051	.000
Age 11 Aggression	.099	0.033	2.954	.003
Age 15 Self-Control (Centred)	.354	0.029	12.137	.000
Age 15 Corporal Punishment (Centred)	.186	0.034	5.412	.000
Age 15 Corporal Punishment x Age 15 Self-Control (Product Term)	-.073	0.037	-1.955	.051
Age 13 Corporal Punishment (Centred)	-.019	0.032	-0.584	.559
Age 13 Self-Control (Centred)	-.066	0.031	-2.137	.033
Age 13 Corporal Punishment x Age 13 Self-Control (Product Term)	.061	0.054	1.117	.264
Age 11 Corporal Punishment (Centred)	.017	0.031	0.525	.600
Age 11 Corporal Punishment x Age 13 Self-Control (Product Term)	-.022	0.033	-0.676	.499
Outcome Variable: Age 13 Aggression				
Age 11 Aggression	.320	.038	8.389	.000
Age 13 Self-Control (Centred)	.428	.029	14.519	.000
Age 13 Corporal Punishment (Centred)	.136	.031	4.401	.000
Age 13 Corporal Punishment x Age 13 Self-Control (Product Term)	.067	.044	1.530	.126
Age 11 Corporal Punishment (Centred)	-.001	.033	-0.022	.982
Age 11 Self-Control (Centred)	-.070	.035	-2.039	.041

Age 11 Corporal Punishment x Age 11 Self-Control (Product Term)	.028	.033	0.846	.398
Outcome Variable: Age 15 Self-Control				
Age 13 Self-Control (Centred)	.441	.027	16.493	.000
Age 11 Self-Control (Centred)	.129	.028	4.579	.000
Outcome Variable: Age 13 Self-Control				
Age 11 Self-Control (Centred)	.448	.027	16.410	.000
Outcome Variable: Age 15 Corporal Punishment				
Age 13 Corporal Punishment (Centred)	.308	.039	7.958	.000
Age 11 Corporal Punishment (Centred)	.169	.044	3.826	.000
Outcome Variable: Age 13 Corporal Punishment				
Age 11 Corporal Punishment (Centred)	.334	.045	7.352	.000
Outcome Variable: Age 11 Aggression				
Age 11 Self-Control (Centred)	.494	.026	19.316	.000
Age 11 Corporal Punishment (Centred)	.192	.032	6.017	.000
Age 11 Corporal Punishment x Age 11 Self-Control (Product Term)	.082	.034	2.397	.017
Correlational Paths				
Age 11 Corporal Punishment correlated with:				
Age 11 Self-Control (Centred)	.187	.033	5.700	.000
Age 11 Corporal Punishment x Age 11 Self-Control (Product Term)	.397	.079	5.034	.000
Age 11 Corporal Punishment x Age 13 Self-Control (Product Term)	.239	.102	2.340	.019
Age 11 Self-Control correlated with:				
Age 11 Corporal Punishment x Age 11 Self-Control (Product Term)	.113	.054	2.098	.036
Age 13 Corporal Punishment correlated with:				
Age 13 Self-Control (Centred)	.184	.039	4.689	.000
Age 13 Corporal Punishment x Age 13 Self-Control (Product Term)	.438	.080	5.492	.000
Age 13 Self-Control correlated with:				
Age 13 Corporal Punishment x Age 13 Self-Control (Product Term)	.159	.056	2.813	.005
Age 15 Corporal Punishment correlated with:				
Age 15 Self-Control (Centred)	.167	.028	5.989	.000
Age 15 Corporal Punishment x Age 15 Self-Control (Product Term)	.397	.055	7.210	.000
Age 15 Self-Control correlated with:				
Age 15 Corporal Punishment x Age 15 Self-Control (Product Term)	.060	.055	1.087	.277
Age 13 Corporal Punishment x Age 13 Self-Control (Product Term) correlated with:				

Age 11 Self-Control (Centred)	.018	.028	.643	.520
Age 11 Corporal Punishment (Centred)	.018	.046	.394	.694
Age 11 Corporal Punishment x Age 11 Self-Control (Product Term)	.137	.066	2.081	.037
Age 15 Corporal Punishment x Age 15 Self-Control (Product Term) correlated with:				
Age 11 Self-Control (Centred)	-.011	.029	-0.382	.703
Age 11 Corporal Punishment (Centred)	.117	.067	1.737	.082
Age 11 Corporal Punishment x Age 11 Self-Control (Product Term)	.099	.037	2.663	.008
Age 13 Corporal Punishment x Age 13 Self-Control (Product Term)	.116	.042	2.765	.006
Age 11 Corporal Punishment x Age 13 Self-Control (Product Term) correlated with				
Age 11 Self-Control (Centred)	.081	.043	1.861	.063
Age 11 Corporal Punishment x Age 11 Self-Control (Product Term)	.588	.075	7.810	.000
Age 13 Corporal Punishment x Age 13 Self-Control (Product Term)	.220	.093	2.379	.017
Age 15 Corporal Punishment x Age 15 Self-Control (Product Term)	.203	.078	2.605	.009

Gender Differences. To determine whether self-control, as an interactive protective factor, differed between males and females, a separate model was fit. The main autoregressive cross-lagged panel model (Figure 8) with paths estimated freely for males and females provided a poor fit to the data ($X^2(72) = 312.46$ $p<.05$, CFI = .85, TLI = .73, RMSEA = .08). Modification indices were examined, and the largest recommended correlational path was added to the model (Age 11 corporal punishment x age 13 self-control product term correlated with age 11 corporal punishment x age 11 self-control product term). Once this was added, the model provided a good fit to the data ($X^2(62) = 121.02$ $p<.05$, CFI = .97, TLI = .94, RMSEA = .04). The results for the autoregressive cross-lagged analysis for males is displayed in Figure 11 and Figure 14 for females, with paths only relevant to interactive protective factors displayed.

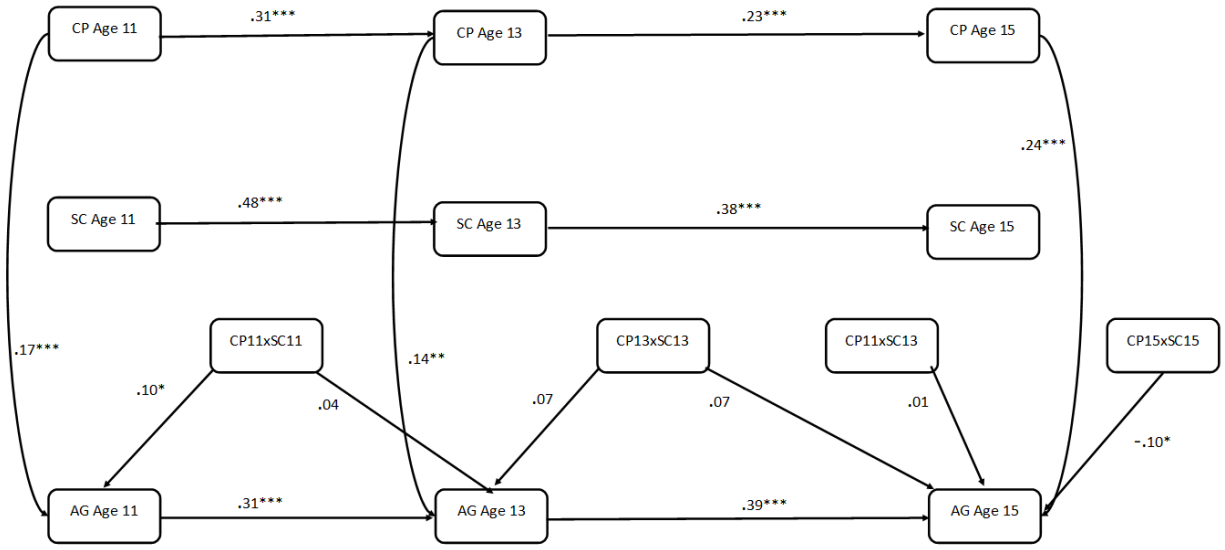
Males. Fully standardized parameter estimates indicate that inter-individual differences in self-control ($\beta_{age11\text{-}13} = .48$, $p<.05$ and $\beta_{age13\text{-}15} = .38$, $p<.05$), corporal punishment ($\beta_{age11\text{-}13} = .31$, $p<.05$ and $\beta_{age13\text{-}15} = .23$, $p<.05$) and aggression ($\beta_{age11\text{-}13} = .31$, $p<.05$ and $\beta_{age13\text{-}15} = .39$, $p<.05$) were stable over time (Figure 11). When examining the main effects between self-control and aggression for males (Table 32) results show that self-control acted as a direct protective factor against concurrent aggression. This suggests that for males, lower levels of low self-control protected against concurrent aggression.

In addition to testing for main effects, self-control was also tested as an interactive protective factor within the same timepoint. Age 11 self-control was tested as an interactive protective factor between age 11 corporal punishment and age 11 aggression. Results indicated that for males, self-control at age 11 was a significant interactive protective factor between age 11 corporal punishment and age 11 aggression (β = .10, p<.05). This shows that higher levels of low self-control exacerbate the negative effects of corporal punishment. Or, reduced levels of low self-control protect against the negative effects of corporal punishment. As displayed in Figure 12, simple slopes are similar to what was found with the full sample. Those with lower levels of low self-control (-1*SD*) also had lower levels of aggression after being exposed to corporal punishment when compared with those who had higher levels of low self-control (+1 *SD*).

The results differed across the developmental stages in adolescence for males. Age 13 self-control was not a significant interactive protective factor between age 13 corporal punishment and age 13 aggression (β = .07, p>.05). However, age 15 self-control showed a significant interaction effect between age 15 corporal punishment and age 15 aggression (β = -.10, p<.05). The significant interaction suggests that low self-control moderates the relation between corporal punishment and aggression. However, the direction of the interaction suggest that age 15 self-control was not a protective factor, but instead a risk enhancer. That is to say, lower levels of low self-control exacerbated the main effect of corporal punishment on aggression. When examining the simple slopes for the age 15 interaction (Figure 13) the interpretation of this interaction becomes clearer. The simple slope shows that for age 15 males, lower levels of low self-control act as a protective factor for those who have been exposed to less corporal punishment. However, for those exposed to high levels of corporal punishment, the protective effect of self-control neutralises, and levels of aggression become the same, irrespective of the individuals level of self-control.

When considering lagged effects, age 11 self-control was not a significant interactive protective factor between age 11 corporal punishment and age 13 aggression (β = .04, p>.05) and age 13 self-control was not a significant interactive protective factor between age 13 corporal punishment and age 15 aggression (β = .07, p>.05). To account for temporal order of variables, the model also examined self-control at age 13 as an interactive protective factor between corporal punishment at age 11 and aggression at age 15. The results indicated there was no significant lagged interaction effect (β = .01, p>.05).

Figure 11 CLPM for Males when Testing Self-Control as an Interactive Protective Factor



Note. *p<.05, **p<.01, ***p<.001. AG = Aggression. SC = Self-control. CP= Corporal Punishment. Lines represent regression paths.

Figure 12 Simple Slopes Showing the Association between Age 11 Corporal Punishment and Age 11 Aggression at High (+1 *SD*) Medium (centred mean) and Low (-1 *SD*) Levels of Low Self-Control for MALES.

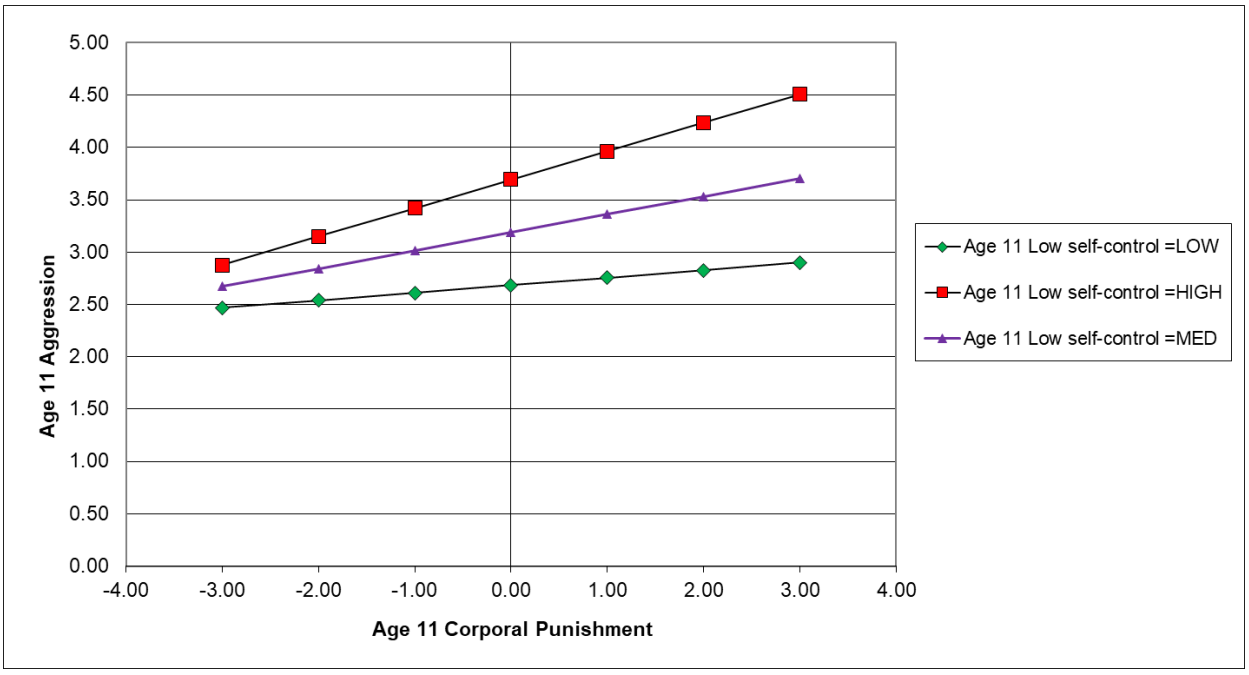


Figure 13 Simple Slopes Showing the Association between Age 15 Corporal Punishment and Age 15 Aggression at High (+1 *SD*) Medium (centred mean) and Low (-1 *SD*) Levels of Low Self-Control for MALES.

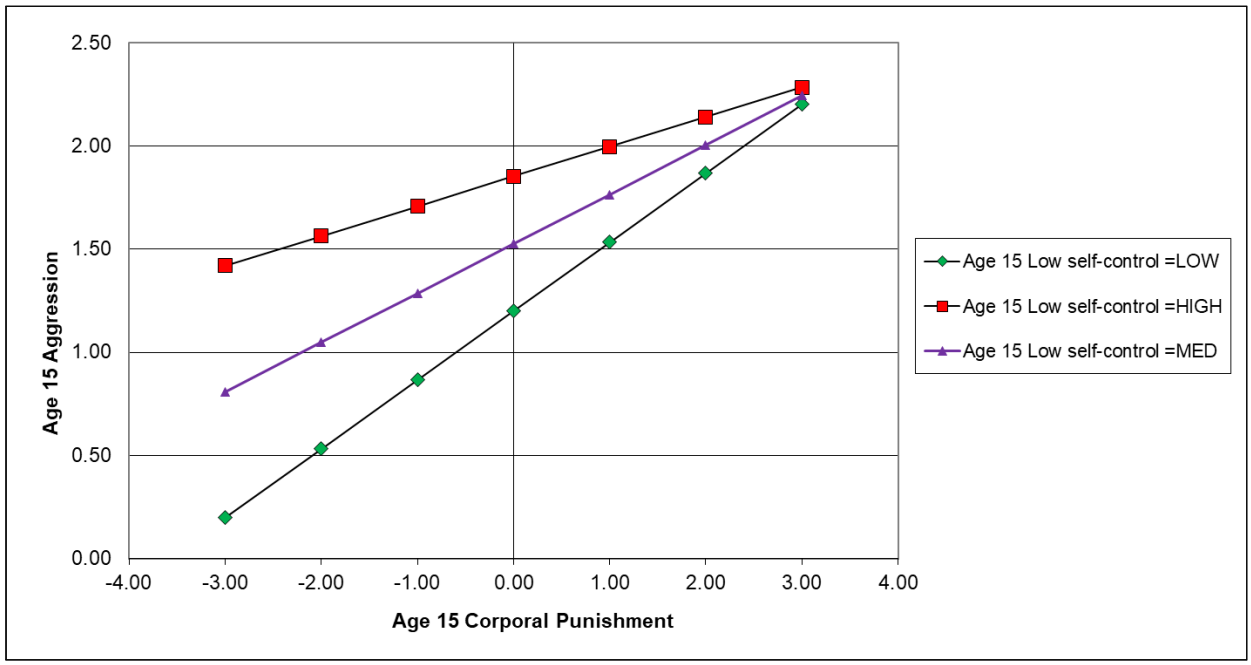


Table 32 Path Results for MALES of Autoregressive CLPM Testing Self-Control as an Interactive Protective Factor

MALES	**Estimate**	***S.E.***	***Est./S.E.***	***Sig.***
Regression Paths				
Outcome Variable: Age 15 Aggression				
Age 13 Aggression	.391	.040	9.727	.000
Age 11 Aggression	.071	.044	1.627	.104
Age 15 Self-Control (Centred)	.326	.039	8.391	.000
Age 15 Corporal Punishment (Centred)	.239	.043	5.595	.000
Age 15 Corporal Punishment x Age 15 Self-Control (Product Term)	-.095	.047	-2.048	.041
Age 13 Corporal Punishment (Centred)	-.049	.042	-1.161	.245
Age 13 Self-Control (Centred)	-.032	.041	-0.795	.427
Age 13 Corporal Punishment x Age 13 Self-Control (Product Term)	.066	.072	0.922	.356
Age 11 Corporal Punishment (Centred)	.081	.043	1.883	.060
Age 11 Corporal Punishment x Age 13 Self-Control (Product Term)	.003	.049	0.056	.956
Outcome Variable: Age 13 Aggression				
Age 11 Aggression	.306	.051	6.009	.000
Age 13 Self-Control (Centred)	.397	.043	9.221	.000
Age 13 Corporal Punishment (Centred)	.138	.040	3.426	.001
Age 13 Corporal Punishment x Age 13 Self-Control (Product Term)	.074	.058	1.271	.204
Age 11 Corporal Punishment (Centred)	-.026	.043	-.597	.550
Age 11 Self-Control (Centred)	-.053	.049	1.070	.285
Age 11 Corporal Punishment x Age 11 Self-Control (Product Term)	.038	.039	.961	.337
Outcome Variable: Age 15 Self-Control				

Age 13 Self-Control (Centred)	.378	.039	9.563	.000
Age 11 Self-Control (Centred)	.145	.039	3.743	.000
Outcome Variable: Age 13 Self-Control				
Age 11 Self-Control (Centred)	.479	.037	12.967	.000
Outcome Variable: Age 15 Corporal Punishment				
Age 13 Corporal Punishment (Centred)	.231	.047	4.931	.000
Age 11 Corporal Punishment (Centred)	.162	.065	2.494	.013
Outcome Variable: Age 13 Corporal Punishment				
Age 11 Corporal Punishment (Centred)	.313	.061	5.112	.000
Outcome Variable: Age 11 Aggression				
Age 11 Self-Control (Centred)	.505	.033	15.468	.000
Age 11 Corporal Punishment (Centred)	.172	.043	3.974	.000
Age 11 Corporal Punishment x Age 11 Self-Control (Product Term)	.100	.044	2.242	.025

Correlational Paths

Age 11 Corporal Punishment correlated with:				
Age 11 Self-Control (Centred)	.146	.042	3.492	.000
Age 11 Corporal Punishment x Age 11 Self-Control (Product Term)	.415	.104	3.994	.000
Age 11 Self-Control correlated with:				
Age 11 Corporal Punishment x Age 11 Self-Control (Product Term)	.143	.056	2.546	.011
Age 13 Corporal Punishment correlated with:				
Age 13 Self-Control (Centred)	.156	.062	2.524	.012
Age 13 Corporal Punishment x Age 13 Self-Control (Product Term)	.486	.106	4.590	.000
Age 13 Self-Control correlated with:				
Age 13 Corporal Punishment x Age 13 Self-Control (Product Term)	.209	.075	2.779	.005
Age 15 Corporal Punishment correlated with:				
Age 15 Self-Control (Centred)	.139	.034	4.047	.000
Age 15 Corporal Punishment x Age 15 Self-Control (Product Term)	.375	.081	4.641	.000
Age 15 Self-Control correlated with:				
Age 15 Corporal Punishment x Age 15 Self-Control (Product Term)	-.041	.060	-.0688	.492
Age 11 Corporal Punishment x Age 13 Self-Control (Product Term) correlated with:				
Age 11 Self-Control (Centred)	.073	.045	1.612	.107
Age 11 Corporal Punishment (Centred)	.298	.130	2.286	.022
Age 11 Corporal Punishment x Age 11 Self-Control (Product Term)	.571	.078	7.304	.000
Age 13 corporal punishment x Age 13 Self-control (product term)	.208	.102	2.033	.042
Age 15 corporal punishment x age 15 self-control (product term)	.322	.101	3.191	.001
Age 13 Corporal Punishment x Age 13 Self-Control (Product Term) correlated with:				
Age 11 Self-Control (Centred)	.031	.033	.941	.347
Age 11 Corporal Punishment (Centred)	.008	.055	.154	.877
Age 11 Corporal Punishment x Age 11 Self-Control (Product Term)	.099	.059	1.678	.093

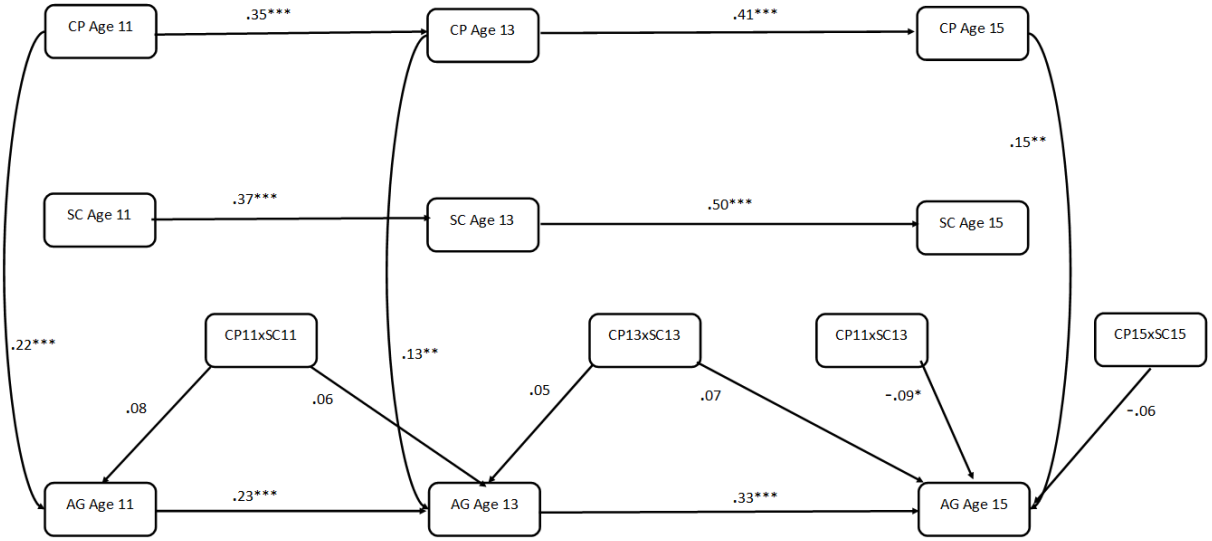
Age 15 Corporal Punishment x Age 15 Self-Control (Product Term) correlated with				
Age 11 Self-Control (Centred)	.026	.035	.746	.456
Age 11 Corporal Punishment (Centred)	.177	.104	1.701	.089
Age 11 Corporal Punishment x Age 11 Self-Control (Product Term)	.137	.052	2.654	.008
Age 13 Corporal Punishment x Age 13 Self-Control (Product Term)	.108	.047	2.302	.021

Females. Similar to the previous models, fully standardized parameter estimates indicate that inter-individual differences in self-control ($\beta_{age11\text{-}13}$ = .37, p<.05 and $\beta_{age13\text{-}15}$ = .50, p<.05) corporal punishment ($\beta_{age11\text{-}13}$ = .35, p<.05 and $\beta_{age13\text{-}15}$ = .41, p<.05) and aggression ($\beta_{age11\text{-}13}$ = .23, p<.05 and $\beta_{age13\text{-}15}$ = .33, p<.05) were stable over time (Figure 14). Once again, main effects between self-control and concurrent aggression were significant which indicates that lower levels of low self-control acted as a direct protective factor for females as well as males. Age 11 self-control was tested as an interactive protective factor between age 11 corporal punishment and age 11 aggression. Different from the males, results indicated that self-control at age 11 was not a significant interactive protective factor between age 11 corporal punishment and age 11 aggression for females (β = .08, p>.05). Similar to the male model, age 13 self-control was not a significant interactive protective factor between age 13 corporal punishment and age 13 aggression (β = .05, p>.05). However, in the female model, age 15 self-control was not a significant moderator between age 15 corporal punishment and age 15 aggression (β = -.06, p>.05) which differed from the male model.

When considering lagged effects, age 11 self-control was not a significant interactive protective factor between age 11 corporal punishment and age 13 aggression (β = .06, p>.05) and age 13 self-control was not a significant interactive protective factor between age 13 corporal punishment and age 15 aggression (β = .07, p>.05). The female model also examined self-control at age 13 as an interactive protective factor between corporal punishment at age 11 and subsequent aggression at age 15. Different to the males, the results indicated that for females, age 13 self-control had a significant interaction effect between age 11 corporal punishment and age 15 aggression (β = -.09, p<.05). This suggests that age 13 self-control is a significant moderator between age 11 corporal punishment and subsequent aggression at age 15. However, the direction of this interaction does not suggest that age 13 self-control is a protective factor. Instead, it suggests that higher levels of age 13 self-control exacerbate the effects of age 11 corporal punishment on subsequent aggression at age 15. Females with higher levels of low self-control actually reported less aggression when exposed to corporal punishment. Upon examination of

the simple slopes in Figure 15, the results show that the degree of exposure to corporal punishment made little difference to levels of aggression for those with low levels of low self-control. However, when exposed to higher amounts of corporal punishment, those with higher levels of low self-control had less aggression.

Figure 14 Autoregressive CLPM for Females when Testing Self-Control as an Interactive Protective Factor



Note. *p<.05, **p<.01, ***p<.001. AG = Aggression. SC = Self-control. CP= Corporal Punishment. Lines represent regression paths.

Figure 15 Simple Slopes Showing the Association between Age 11 Corporal Punishment and Age 15 Aggression at High (+1 *SD*) Medium (centred mean) and Low (-1 *SD*) Levels of Age 13 Low Self-Control for FEMALES.

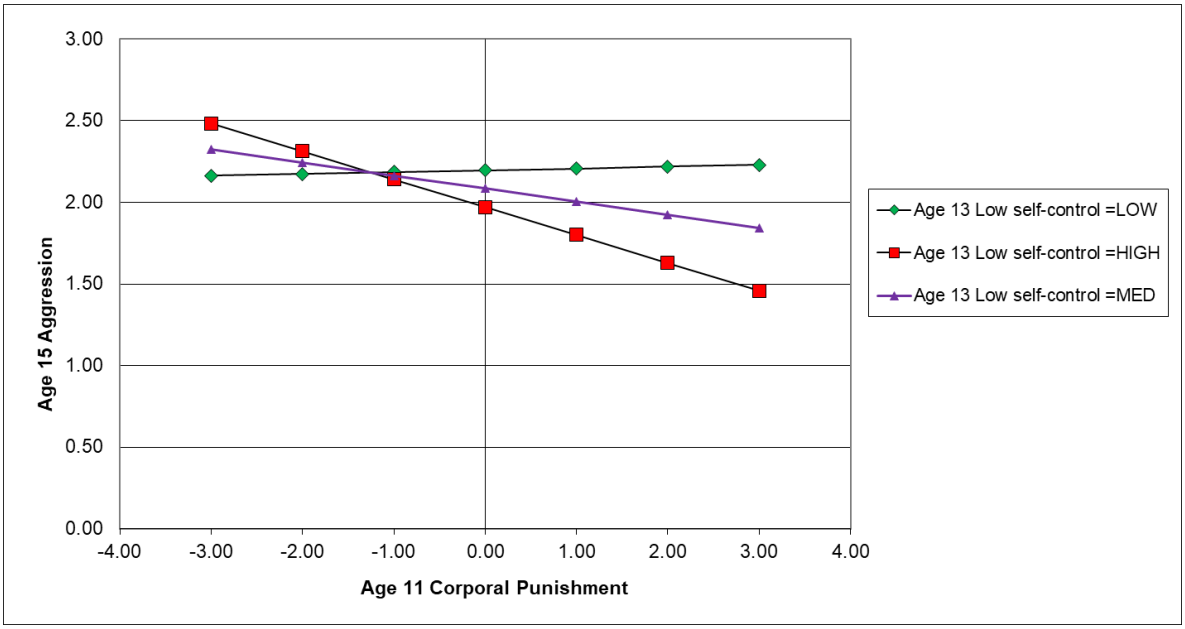


Table 33 Path Results for FEMALES of Autoregressive CLPM Testing Self-Control as an Interactive Protective Factor

Females	**Estimate**	***S.E.***	***Est./S.E.***	***Sig.***
Regression Paths				
Outcome Variable: Age 15 Aggression				
Age 13 Aggression	.327	.052	6.348	.000
Age 11 Aggression	.090	.050	1.779	.075
Age 15 Self-Control (Centred)	.424	.042	10.053	.000
Age 15 Corporal Punishment (Centred)	.152	.051	2.973	.003
Age 15 Corporal Punishment X Age 15 Self-Control (Product Term)	-.058	.064	-0.914	.361
Age 13 Corporal Punishment (Centred)	.044	.046	0.967	.334
Age 13 Self-Control (Centred)	-.113	.046	-2.461	.014
Age 13 Corporal Punishment X Age 13 Self-Control (Product Term)	.070	.052	1.329	.184
Age 11 Corporal Punishment (Centred)	-.080	.044	-1.806	.071
Age 11 Corporal Punishment X Age 13 Self-Control (Product Term)	-.091	.042	-2.176	.030
Outcome Variable: Age 13 Aggression				
Age 11 Aggression	.231	.052	4.455	.000
Age 13 Self-Control (Centred)	.489	.038	12.803	.000
Age 13 Corporal Punishment (Centred)	.126	.048	2.652	.008
Age 13 Corporal Punishment X Age 13 Self-Control (Product Term)	.052	.044	1.183	.237
Age 11 Corporal Punishment (Centred)	.045	.049	0.917	.359
Age 11 Self-Control (Centred)	-.117	.050	-2.347	.019
Age 11 Corporal Punishment X Age 11 Self-Control (Product Term)	.061	.076	0.801	.423
Outcome Variable: Age 15 Self-Control				
Age 13 Self-Control (Centred)	.498	.034	14.458	.000
Age 11 Self-Control (Centred)	.126	.040	3.141	.002
Outcome Variable: Age 13 Self-Control				
Age 11 Self-Control (Centred)	.370	.042	8.904	.000

Outcome Variable: Age 15 Corporal Punishment				
Age 13 Corporal Punishment (Centred)	.408	.058	7.019	.000
Age 11 Corporal Punishment (Centred)	.192	.060	3.204	.001
Outcome Variable: Age 13 Corporal Punishment				
Age 11 Corporal Punishment (Centred)	.353	.066	5.309	.000
Outcome Variable: Age 11 Aggression				
Age 11 Self-Control (Centred)	.430	.045	9.620	.000
Age 11 Corporal Punishment (Centred)	.224	.050	4.487	.000
Age 11 Corporal Punishment X Age 11 Self-Control (Product Term)	.075	.043	1.749	.080

Correlational Paths

Age 11 Corporal Punishment Correlated With:				
Age 11 Self-Control (Centred)	.220	.054	4.081	.000
Age 11 Corporal Punishment X Age 11 Self-Control (Product Term)	.379	.124	3.047	.002
Age 11 Self-Control Correlated With:				
Age 11 Corporal Punishment X Age 11 Self-Control (Product Term)	.077	.112	.685	.493
Age 13 Corporal Punishment Correlated With:				
Age 13 Self-Control (Centred)	.210	.042	5.038	.000
Age 13 Corporal Punishment X Age 13 Self-Control (Product Term)	.373	.103	3.623	.000
Age 13 Self-Control Correlated With:				
Age 13 Corporal Punishment X Age 13 Self-Control (Product Term)	.043	.069	.618	.537
Age 15 Corporal Punishment Correlated With:				
Age 15 Self-Control (Centred)	.193	.043	4.450	.000
Age 15 Corporal Punishment X Age 15 Self-Control (Product Term)	.404	.072	5.567	.000
Age 15 Self-Control Correlated With:				
Age 15 Corporal Punishment X Age 15 Self-Control (Product Term)	.139	.081	1.712	.087
Age 11 Corporal Punishment X Age 13 Self-Control (Product Term) Correlated With:				
Age 11 Self-Control (Centred)	.079	.087	.913	.361
Age 11 Corporal Punishment (Centred)	.123	.149	.824	.410
Age 11 Corporal Punishment X Age 11 Self-Control (Product Term)	.603	.136	4.432	.000
Age 13 Corporal Punishment X Age 13 Self-Control (Product Term)	.246	.095	2.603	.009
Age 15 Corporal Punishment X Age 15 Self-Control (Product Term)	.066	.045	1.469	.142
Age 13 Corporal Punishment X Age 13 Self-Control (Product Term) Correlated With:				
Age 11 Self-Control (Centred)	-.003	.053	-.060	.952
Age 11 Corporal Punishment (Centred)	.070	.078	.903	.366
Age 11 Corporal Punishment X Age 11 Self-Control (Product Term)	.230	.091	2.542	.011
Age 15 Corporal Punishment X Age 15 Self-Control (Product Term) Correlated With				
Age 11 Self-Control (Centred)	-.051	.040	-1.275	.202
Age 11 Corporal Punishment (Centred)	.065	.054	1.210	.226
Age 11 Corporal Punishment X Age 11 Self-Control (Product Term)	.062	.040	1.559	.119
Age 13 Corporal Punishment X Age 13 Self-Control (Product Term)	.171	.071	2.398	.016

Discussions and Conclusions

Prior research has identified that those who experience corporal punishment do tend to develop increased aggression in later adolescence; however, very little is known about the factors that ameliorate the effects of corporal punishment or protect those who experience corporal punishment from developing subsequent aggression. The purpose of this chapter was to investigate the role of self-control as an interactive protective factor between corporal punishment and aggression.

Within the baseline analysis (see Chapter 5), it was found that experiencing corporal punishment significantly predicted subsequent aggression. This remained the case after taking into account previous levels of aggression. Those who experienced corporal punishment were significantly more likely to develop increased aggression two years later. These results are consistent with a large number of studies indicating that corporal punishment does lead to increased aggression within the same time points (age 11) and across time points (age 15). However, not all young people who experienced corporal punishment developed subsequent aggression, suggesting a possible protective factor was present.

When examining correlations between self-control and levels of aggression, this study found that low self-control at ages 11, 13 and 15 had a positive significant correlation with aggression at all ages. This indicates that increased levels of low self-control resulted in increased levels of aggression with the strongest correlations being found within the same time points. These findings are in line with previous research (de Kemp et al., 2009; Keatley et al., 2017). When examining gender differences in levels of low self-control, the current study found that males exhibited higher levels of low self-control than females. This is also supported in previous literature. For example, Gottfredson and Hirschi (1990) argue that there are differences between male and female crime rates which are due to differences in the levels of self-control that males and females have. They argue that boys are often monitored less; therefore, girls develop higher levels of self-control.

Hierarchical regression analyses were used to examine the degree to which self-control predicted aggression, both within and across timepoints. Findings indicate significant main effects with age 11 low self-control predicting higher levels of aggression at age 11, age 13 and age 15. This was also the case for age 13 low self-control; significant main effects were found when predicting aggression at age 13 and age 15. Finally, when examining low self-control experienced at age 15, as per the previous analyses, significant main effects were found when predicting age 15

aggression, suggesting that higher levels of low self-control were linked to higher levels of aggression. Significant main effects between self-control and aggression were less consistent when accounting for prior levels of aggression in the autoregressive cross-lagged models. Similar to the hierarchical regressions, significant main effects were found between self-control and concurrent aggression; however, main effects were non-significant for subsequent aggression at a later age. This suggests that, when accounting for previous levels of aggression, self-control was a direct protective factor for concurrent aggression, but not for subsequent aggression. Findings regarding the significant main effects of self-control on concurrent aggression are supported with previous literature which argues that higher levels of self-control results in less antisocial behaviours (Gottfredson & Hirschi, 1990).

In this chapter it was found that self-control moderated the relation between corporal punishment and aggression within time points at age 11 but not within time points at ages 13 and 15 for the full sample. At age 11, lower levels of low self-control acted as an interactive protective factor between age 11 corporal punishment and age 11 aggression. This indicates that higher levels of self-control reduced the main effects of corporal punishment at age 11, but not within age 13 and age 15. This is in line with previous research (Vassallo et al., 2016) which found that high levels of self-regulation at ages 11-12 protected against violent behaviours. When considering self-control as an interactive protective factor between corporal punishment and subsequent aggression, age 13 self-control was not found to be a significant protective factor between age 11 corporal punishment and age 15 aggression for the full sample.

When gender differences were examined, results show that age 11 self-control was an interactive protective factor between age 11 corporal punishment and age 11 aggression for males but not for females. This indicates that for males, higher levels of self-control protected against the adverse effects of corporal punishment at age 11. With regards to age 15 self-control for males, results show that age 15 self-control had a significant interaction between age 15 corporal punishment and age 15 aggression. This does suggest that age 15 self-control significantly moderates the relation between age 15 corporal punishment and age 15 aggression, however, as discussed, the direction of the interaction is not indicative of this being a protective factor. Instead, the results indicate that higher levels of self-control exacerbated the main effects of corporal punishment on aggression for males. One possible explanation for this result could be attributed to the fact that this interaction is being tested within the same timepoint as the risk factor and the outcome variable which makes it difficult to ascertain temporal order. For example, it

could be the case that for those with low self-control, less corporal punishment exacerbates the relation between low self-control and aggression for age 15 males. This suggest that corporal punishment is actually protecting against the adverse effects of low self-control on concurrent levels of aggression. Support for corporal punishment has been found in previous research (Larzelere & Khun, 2005). Larzelere and Khun (2005) found that, in some circumstances, mild and occasional spanking had a positive effect on children's compliance. It might be the case that age 15 males with low self-control had reduced levels of aggression if they had been exposed to more harsh parenting discipline techniques. This is a finding that needs to be interpreted very carefully and does not provide support for the use of corporal punishment. However, it does highlight the need to further investigate self-control as a moderator between corporal punishment and aggression.

When considering gender differences with regards to lagged effects, age 13 self-control did not have a significant interaction between age 11 corporal punishment and age 15 aggression for males, but it did for females. Results indicate that for females, age 13 self-control was a significant moderator between age 11 corporal punishment and age 15 aggression. However, as before, the direction of this interaction does not suggest that age 13 self-control is a protective factor. Instead, it suggests that at age 13 higher levels of self-control is a possible risk enhancer for females as higher levels of self-control exacerbated the main effects of corporal punishment on subsequent aggression. These results, along with those discussed above, suggest that the protective effect of self-control can differ depending on gender, the degree of risk and the developmental stage of the adolescent. This is important to consider when designing intervention programmes that aim to reduce adolescent aggression amongst those exposed to corporal punishment.

Chapter 7: Positive Teacher-child Relationship as an Interactive Protective Factor

Introduction

Previous research (e.g. Gershoff, 2002) has shown that exposure to corporal punishment has a main effect on developing increased adolescent aggression. This was also evidenced in Chapter 5 of this thesis. However, it remains the case that not all young people who experience corporal punishment become aggressive. Analyses in Chapter 6 found that self-control acts as an interactive protective factor between corporal punishment and aggression at age 11; however, these interactive protective effects were not consistent across all age groups. Nevertheless, the results show that self-control had significant main effects across all age groups, which was an indication of a direct protective effect against aggression. Still, more research needs to be done to examine different domains of protective factors as a means to identify interactive protective factors that can be applied to the various developmental stages in adolescence. Thus, in addition to examining how protective factors operate within an individual dispositional level (i.e. self-control), this thesis will also seek to investigate protective factors from an environmental level (i.e. positive teacher-child relationships). The following chapter examines the protective effect of a positive teacher-child relationship with regards to exposure to corporal punishment and adolescent aggression.

Positive Teacher-child Relationship as an Interactive Protective Factor

Given that parents are often the primary attachment figure for children and adolescents, relationships with parents have been the main focus within attachment literature (De Laet, Colpin, Goossens, Van Leeuwen, & Verschueren, 2014). The parent-child relationship and its association with externalizing behaviours has been researched extensively (Doumen et al., 2008); however, research now also shows that the quality of a teacher-child relationship can shape the development of externalizing behaviour amongst young people (Silver, Measelle, Armstrong, & Essex, 2005). The study of the teacher-child relationship has primarily been influenced by Robert Pianta (e.g. Pianta & Stuhlman, 2004; Stuhlman & Pianta, 2001). Some argue that, despite the wealth of research and literature, teachers underestimate the impact of a positive teacher-child relationship on healthy adolescent development (Davis & Dupper, 2004). Thus, it is important that research continues to contribute to the understanding of the impact of positive teacher-child relationships on adolescent development and externalizing behaviours.

Various developmental theories have highlighted the importance of having a positive teacher-child relationship with regards to adolescent development, such as social-motivation theory, interpersonal theory, social bond theory and developmental systems theory (Sabol & Pianta, 2012). Each of these theories highlight the importance of emotional support for students as a means to foster healthy development for young people and support the argument that having a positive relationship with a teacher can play an important role in modifying classroom behaviour (Silver et al., 2005). The attachment framework suggests that the quality of a teacher-child relationship is influenced by the quality of parent-child attachments formed earlier in childhood (Cyr, Pasalich, McMahon, & Spieker, 2014; Dallaire & Weinraub, 2007; Sabol & Pianta, 2012). When children form positive attachments with their parents in early childhood, they develop the ability to be able to form attachments with others. This, in turn, can result in attachments being transferred to other positive adult role models as the child develops into adolescence. It is often the case that the 'other positive adult' is a teacher.

Previous research has found that having a secure positive teacher-child relationship can result in the development of positive affect and socially competent interactions with others (Hughes, Cavell, & Jackson, 1999)**.** Furthermore, observational studies show support for the argument that positive teacher-child relationships are important for the development of positive behavioural outcomes. For example, Silver et al. (2005) examined the effect that having a positive teacher-child relationship had on the development of positive externalizing behaviours within the classroom for primary school children. Their results show that positive relationships with teachers protected against the risk associated with higher levels of disruptive behaviour in the classroom. Additionally, Tiet, Huizinga and Byrnes (2010) also provide evidence of an association between positive teacher-child relationships and fewer antisocial behaviours. They found that a positive teacher-child relationship was a significant predictor of lower levels of antisocial behaviour for adolescents. Their results suggest that a positive teacher-child relationship had direct main effects on reduced antisocial behaviour and indirect effects on better youth adjustment.

Having a positive relationship with a teacher has potential protective capabilities. As discussed by Sabol and Pianta (2012), it has been argued that having a supportive relationship with an adult protects against multiple risk factors within adolescence. Moreover, this supportive adult can be a teacher, as it has been found that positive relationships with teachers can act as interactive protective factors against risks (Stuhlman & Pianta, 2001). According to Oberle et al. (2014), adult support is positively associated with emotional well-being and school support is the most

important form of adult support when compared with family and neighbourhood support systems. It was also found that young people often viewed their school-based relationships as being more important than those within the family.

It could also be suggested that having a positive teacher-child relationship could help prevent a young person from acting in an aggressive way, which, in turn, allows them to develop more prosocial behaviours. For example, as discussed by Blankemeyer et al. (2002), having a positive teacher-child relationship can have an ameliorative effect on adolescent aggression. In other words, aggressive young people who had a strong teacher-child relationship were found to be less aggressive in the following year. A suggested causal mechanism of the protective effect of teacher-child relationships could be that a positive teacher-child relationship has a positive influence on perceptions of the young person from their peers. For example, Howes, Hamilton, and Matheson (1994) found that positive responses from teachers during peer interactions resulted in the young people involved being more accepting of each other. Positive peer interactions could then lead to less instances of conflict and less opportunity for a young person to behave in an aggressive manner.

As was the case with self-control, gender differences should be considered when examining positive teacher-child relationships as an interactive protective factor. This is because the quality of a teacher-child relationship can differ for males and females (Blankemeyer et al., 2002). For example, Birch and Ladd (1997) found that teachers reported closer relationships and less conflicts with females when compared to males. This may be due to the fact that girls are often less aggressive than boys, which is consistent with previous research as well as findings from Chapter 5 in this thesis. This is important to consider when examining the protective capabilities of a positive teacher-child relationship with regards to corporal punishment and adolescent aggression. Based on the above discussion, positive teacher-child relationships warrant further investigation as an interactive protective factor between corporal punishment and adolescent aggression.

The Current Study

The current study seeks to test the hypothesis that having a positive teacher-child relationship can protect against the adverse effects of corporal punishment with regards to adolescent aggression. While there is evidence that supports the link between teacher-student relationships and well-being in young children (Maldonado-Carren & Votruba-Drzal, 2011; O'Connor, Collins,

& Supplee, 2012), less is known about positive teacher-child relationships as an interactive protective factor. No study to date has – to my knowledge – tested positive teacher-child relationships as an interactive protective factor between corporal punishment and aggression while accounting for previous levels of aggression. In addition to examining positive teacher-child relationships as an interactive protective factor, this study will also examine main effects and gender differences when considering the relation between corporal punishment, teacher-child relationships and aggression.

Methods

This chapter used the same overall methodological approach that was used in Chapter 6. Main effects and interactive protective factors were tested using autoregressive cross-lagged panel models estimated in Mplus 8 (Muthen & Muthen, 1998 – 2017). As discussed in Chapter 6, an autoregressive cross-lagged panel model was used to test for main effects and interactive protective factors while accounting for previous levels of aggression, exposure to corporal punishment and levels of positive teacher-child relationships (Hamaker et al., 2015). Descriptive statistics, correlations and regressions were all run using IBM SPSS version 24.

Positive Teacher-Child Relationships Scale

Previous research which examined the relation between students and teachers had often used the measurement of 'affective quality' when assessing the teacher-child relationship (De Laet et al., 2014). A measure of affective quality includes examining the degree to which students have open communication with teachers and use them as a safe haven and a secure base away from home. When examining the student-reported measure of teacher-child relationships, previous research asked students to report their perceived support from teachers (Blankemeyer et al., 2002). Moreover, measures of teacher-child relationships with older students typically use questionnaires which assess key constructs such as perceived support, reliance on the teacher, and feeling accepted by the teacher which have been considered reliable measures (Sabol & Pianta, 2012). However, it is the case that the majority of research focuses on teacher-child relationships within primary schools, with less attention on those in secondary schools (De Laet et al., 2014).

For the current study, positive teacher-child relationships were measured at ages 11, 13 and 15 by asking students to report their relationship with their teacher. They did this by rating the following three statements on a 4-point Likert scale from completely untrue = '1' to completely

true= '4': 'I get along with my teacher', 'the teacher is fair to me', and 'the teacher supports me' ($\alpha_{age\ 11}$ = .78, $\alpha_{age\ 13}$ = .77, $\alpha_{age\ 15}$ = .82). A mean score of their responses was utilized to create the scale for the current analyses. A child self-reported measure of teacher-child relationships was used in this study as it was suspected that, in terms of how the young person was behaving, it was more important to measure how the young person perceived their relationship with the teacher, rather than how the teacher perceived it. For example, the teacher might believe they have a great relationship with the child, but if the child does not feel that way, then that is going to be the more important element in driving the child's behaviour.

Measures of corporal punishment and aggression were discussed in Chapter 4.

The Analytic Plan

The analytic plan for Chapter 7 is similar to that of the previous empirical chapters. I began by examining associations between positive teacher-child relationships and adolescent aggression to assess whether stronger relationships with teachers would be associated with lower levels of aggression. I then administered an autoregressive cross-lagged panel model to examine the hypothesis that having a positive teacher-child relationship would act as an interactive protective factor between corporal punishment and aggression. Finally, the above was split by gender to ascertain if there were any differences in the protective capabilities of positive teacher-child relationships for males and females.

Hierarchical Regression

Hierarchical multiple regression analyses were administered as a means to examine whether or not having a positive teacher-child relationship was a predictor of lower levels of aggression within and across time points. As was discussed in Chapter 5 and Chapter 6, the change in *R* is calculated after predictors are added to the model in a series of steps. The change in *R* is tested to determine if it is significantly different from zero. This helps to determine whether including that specific predictor significantly improved the prediction of the outcome variable. The relative contribution of each variable in predicting the outcome variable is determined by calculating β. As was the case in Chapters 5 and 6, gender and socioeconomic status were entered into the regression first, with corporal punishment being added into the second step. Finally, teacher-child relationship was added to the third step of the regressions. Hierarchical regressions that tested positive teacher-child relationships at age 11 predicting less aggression at ages 11, 13 and 15 were conducted first. The second group of hierarchical regressions tested positive teacher-child

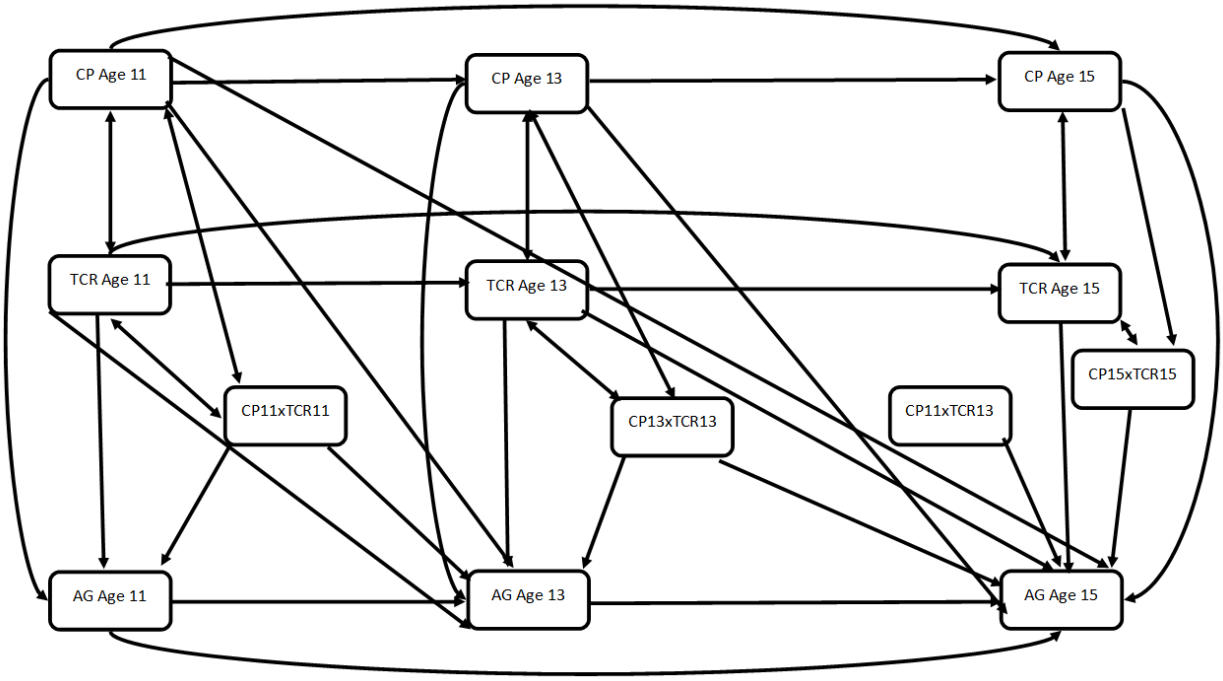
relationships at age 13 as a predictor of lower aggression at age 13 and 15. The third group of hierarchical regressions included age 15 positive teacher-child relationships as a predictor of lower levels of aggression at age 15.

Autoregressive Cross-lagged Panel Model

Given that previous research has found that having a positive teacher-child relationship can result in the development of positive behavioural outcomes (Silver et al, 2005) and fewer antisocial behaviours (Tiet, Huizinga and Byrnes, 2010), I hypothesised that having a positive teacher-child relationship would result in lower levels of aggression amongst those who have been exposed to corporal punishment while controlling for previous levels of aggression. Thus, having a positive teacher-child relationship was tested as an interactive protective factor by using an autoregressive cross-lagged panel model (Figure 16). As was the case in Chapter 6, all predictor variables (corporal punishment and teacher-child relationship) were first centred before being entered into the model. Product terms were created by multiplying the two centred predictor variables together before being used to test for interactions. Models were then split by gender as a means to identify any differences of the protective effect of positive teacher-child relationships for males and females.

When testing positive teacher-child relationships as an interactive protective factor, variable scores were based on longitudinal data. An autoregression was administered as a means to account for stability of teacher-child relationships, aggression and corporal punishment. To account for data missingness and skewness MLR was used. As per the previous empirical chapters, a good model fit was evaluated using CFI (>.95), TLI (>.95) and RMSEA (<.06) (Bentler, 1990). Standardized regressions, coefficients or betas are presented throughout and are interpreted as indicators of relative effect size. Similar to Chapter 6, simple slopes were created using standardized regression coefficients from the autoregressive cross-lagged panel model.

Figure 16 Autoregressive Cross-lagged Panel Model Testing for Interactions: Teacher-Child Relationships



Note. AG = Aggression. CP = Corporal Punishment. TCR = Teacher-child Relationship. Lines with one arrow represent regression paths. Lines with two arrows represent correlational paths.

Results: Positive Teacher-child Relationships

Descriptive Statistics: Positive Teacher-child Relationships

General estimates of the levels of positive teacher-child relationships showed that mean levels for the full sample decreased as participants got older (Table 34). With regards to gender differences, the results show that females had slightly higher levels of having a positive teacher-child relationship when compared with males. This finding is consistent with previous research which found that teachers reported having stronger relationships with females than with males (Birch & Ladd, 1997).

Table 34 Teacher-Child Relationships Descriptive Statistics

	N	*M*	*SD*	Range	Skewness	Kurtosis
Age 11	**1134**	**3.47**	**0.59**	**1-4**	**-1.259**	**1.672**
Males	576	3.39				
Females	558	3.56				
Age 13	**1361**	**3.15**	**0.65**	**1-4**	**-.710**	**.066**
Males	702	3.12				
Females	659	3.20				
Age 15	**1446**	**3.06**	**0.67**	**1-4**	**-.662**	**.064**
Males	749	3.03				
Females	697	3.10				

Correlations: Teacher-child Relationships

Chapter 5 provides a more detailed description of the results for associations between corporal punishment experienced at difference ages within the sample. Consistent associations were found with higher levels of corporal punishment at one point being associated with higher levels of corporal punishment experienced at all other time points. Furthermore, positive associations were also found between corporal punishment and aggression, with higher levels of corporal punishment being associated with higher levels of aggression across all time points. Significant gender differences were found with regards to exposure to corporal punishment at ages 11 and 13 with females reporting less corporal punishment than males. Females were also found to report less aggression than males across all age groups.

When considering associations between corporal punishment and positive teacher-child relationships across time points, corporal punishment experienced at age 11 showed a negative significant correlation with teacher-child relationships at age 11 (r = -.15, p<.05) and age 13 (r = -.10, p<.05) but not at age 15 (r = -.04, p>.05). This shows that less corporal punishment at younger ages is associated with higher levels of positive teacher-child relationships; however, the correlations are quite small. Furthermore, corporal punishment experienced at age 13 had a negative significant correlation with teacher-child relationships at age 11 (r = -.12, p<.05) and age 13 (r = -.17, p<.05) but not age 15 (r = .02, p>.05). Finally, corporal punishment experienced at age 15 had a negative significant correlation with teacher-child relationships at age 15 (r = -.12, p<.05) but not age 11 (r = -.01, p>.05) or age 13 (r = -.10, p>.05). For older children, experiencing corporal punishment was significantly associated with lower levels of positive teacher-child relationships at the same time point.

Previous research has found that higher levels of aggression within young people often results in weaker relationships with teachers (Sabol & Pianta, 2012). Results from the current study are consistent with previous research. For example, results show that age 11 aggression had a negative significant correlation with having a positive teacher-child relationship at age 11 (r = -.32, p<.05), age 13 (r = -.22 p<.05) and age 15 (r = -.16, p<.05). This indicates that those who had higher levels of aggression reported having weaker relationships with their teachers. Similar results were found with regards to age 13 aggression and positive teacher-child relationships (r_{age11} = -.22, p<.05; r_{age13} = -.32, p<.05; r_{age15} = -.18, p<.05) as well as age 15 aggression and positive teacher-child relationships (r_{age11} = -.12, p<.05; r_{age13} = -.19, p<.05; r_{age15} = -.24, p<.05). Correlation results indicate higher levels of self-reported aggression were associated with less positive relationships with teachers, with the strongest correlation being found within the same time points.

Table 35 Correlations with Positive Teacher-child Relationships, Aggression and Corporal Punishment

	1	2	3	4	5	6	7	8	9	10
Gender	-.01	-.09**	-.07**	.01	-.25**	-.27**	-.23**	.14**	.06*	.05
1. SES		-.02	-.05	-.08**	.01	-.03	-.08**	-.07*	.01	-.06*
Corporal Punishment										
2. Age 11			.33**	.25**	.32**	.17**	.17**	-.15**	-.10**	-.04
3. Age 13				.41**	.12**	.28**	.21**	-.12**	-.17**	.02
4. Age 15					.09**	.16**	.28**	-.01	-.10	-.12**
Aggression										
5. Age 11						.43**	.34**	-.32**	-.22**	-.16**
6. Age 13							.55**	-.22**	-.32**	-.18**
7. Age 15								-.12**	-.19**	-.24**
Teacher-Child Relationship										
8. Age 11									.25**	.15**
9. Age 13										.32**
10. Age 15										

Note. *p<.05 **p<.01. SES = Socioeconomic Status.

Regressions: Teacher-child Relationship

Hierarchical regression analyses were used to examine the degree to which having a positive teacher-child relationship predicted aggression both within and across time points. The outcome measure used in the regressions was self-reported aggression. For the regression analyses, the control variables (gender and socioeconomic status) were entered into the first step, corporal punishment was entered into the second step, with positive teacher-child relationships being entered into the third step.

Age 11 Positive Teacher-child Relationships Predicting Aggression. Table 36 displays the results of the separate regression analyses of positive relationships with teachers at age 11 predicting aggression within and across time points. In the first step of the group of models, gender significantly predicted self-reported aggression at age 11 (β = -.25, p<.05), age 13 (β = -.28, p<.05) and age 15 (β = -.22, p<.05) and socioeconomic status significantly predicted self-reported aggression at age 13 (β = -.11, p<.05) and age 15 (β = -.09, p<.05) but not age 11 (β = -.01, p>.05; Step 1: R^2_{age11} = .06; R^2_{age13} = .09; R^2_{age15} = .06). In the second step, corporal punishment experienced at age 11 was added to the regressions. There were significant main effects for age 11 corporal punishment and age 11 aggression with higher levels of corporal punishment linked to higher levels of aggression (β = .29, p<.05). When age 11 corporal punishment was included in the regression, the amount of variance explained increased by 9% (R^2 = .15). In the second group of analyses, the effect of age 11 corporal punishment on age 13 aggression was examined. There were significant main effects for age 11 corporal punishment and age 13 aggression with higher levels of corporal punishment linked to higher levels of aggression (β = .14, p<.05). When age 11 corporal punishment was included in the regression, the amount of variance explained increased by 1% (R^2 = .10). In the third group of analyses, the effect of age 11 corporal punishment on age 15 aggression was examined. There were significant main effects for age 11 corporal punishment and age 15 aggression with higher levels of corporal punishment linked to higher levels of aggression (β = .14, p<.05). When age 11 corporal punishment was included in the regression, the amount of variance explained increased by 1% (R^2 = .07).

In the third step of the group of models, positive teacher-child relationships at age 11 was added. There were significant main effects for positive teacher-child relationships at age 11 and age 11 aggression with higher levels of positive teacher-child relationships linked to lower levels of aggression (β = -.26, p<.05). When having a positive teacher-child relationship at age 11 was included in the regression, the amount of variance explained increased by 6% (R^2 = .21). In the

second group of analyses, the effect of positive teacher-child relationships at age 11 on age 13 aggression was examined. There were significant main effects for positive teacher-child relationships at age 11 and age 13 aggression with higher levels of positive teacher-child relationships linked to lower levels of aggression (β = -.18, p<.05). When positive teacher-child relationships at age 11 was added to the regression, the amount of variance explained increased by 4% (R^2 = .14). In the third group of analyses, the effect of positive teacher-child relationships at age 11 on age 15 aggression was examined. There were significant main effects for positive teacher-child relationships at age 11 and age 15 aggression with higher levels of having a positive teacher-child relationship linked to lower levels of aggression (β = -.08, p<.05). When teacher-child relationships at age 11 was included in the regression, the amount of variance explained increased by 1% (R^2 = .08).

Age 13 Positive Teacher-child Relationships Predicting Aggression. Table 37 shows the results of the separate regression analyses of positive teacher-child relationships at age 13 predicting aggression at age 13 and age 15. In the first step of the group of models, gender significantly predicted self-reported aggression at age 13 (β = -.27, p<.05) and 15 (β = -.23, p<.05), and socioeconomic status predicted self-reported aggression at age 15 (β = -.082, p<.05) but not age 13 (β = -.04, p>.05; Step 1: R^2_{age13} = .07; R^2_{age15} = .06). In the second step, corporal punishment experienced at age 13 was added to the regressions. There were significant main effects for age 13 corporal punishment and age 13 aggression with higher levels of corporal punishment linked to higher levels of aggression (β = .26, p<.05). When age 13 corporal punishment was included in the regression, the amount of variance explained increased by 7% (R^2 = .14). In the second group of analyses, the effect of age 13 corporal punishment on age 15 aggression was examined. There were significant main effects for age 13 corporal punishment and age 15 aggression with higher levels of corporal punishment linked to higher levels of aggression (β = .19, p<.05). When age 13 corporal punishment was included in the regression, the amount of variance explained increased by 3% (R^2 = .09). In the third step of the regression, teacher-child relationship for age 13 was added. There were significant main effects for positive teacher-child relationships at age 13 and age 13 aggression with higher levels of positive teacher-child relationships linked to lower levels of aggression (β = -.27, p<.05). When positive teacher-child relationship at age 13 was included in the regression, the amount of variance explained increased by 7% (R^2 = .21). In the second group of analyses, the effect of having a positive teacher-child relationship at age 13 on age 15 aggression was examined. There were significant main effects for positive teacher-child relationships at age 13 and age 15 aggression with higher

levels of positive teacher-child relationships linked to lower levels of aggression (β = -.15, p<.05). When positive teacher-child relationship at age 13 was included in the regression, the amount of variance explained increased by 2% (R^2 = .11).

Age 15 Positive Teacher-child Relationships Predicting Aggression. Table 38 shows the results of the separate regression analysis of positive teacher-child relationships at age 15 predicting aggression at age 15. In the first step of the model, gender significantly predicted self-reported aggression at 15 (β = -.23, p<.05) and socioeconomic status predicted self-reported aggression at age 15 (β = -.08, p<.05; Step 1: R^2 = .06). In the second step, corporal punishment experienced at age 15 was added to the regressions. There were significant main effects for age 15 corporal punishment and age 15 aggression with higher levels of corporal punishment linked to higher levels of aggression (β = .28, p<.05). When age 15 corporal punishment was included in the regression, the amount of variance explained increased by 8% (R^2 = .14). In the third step, positive teacher-child relationship at age 15 was added to the regression. There were significant main effects for positive teacher-child relationships at age 15 and age 15 aggression with higher levels of positive teacher-child relationships linked to lower levels of aggression (β = -.20, p<.05). When positive teacher-child relationship at age 15 was included in the regression, the amount of variance explained increased by 3% (R^2 = .17).

Table 36 Hierarchical Regression Analysis for Age 11 Teacher-Child Relationships Predicting Self-Reported Aggression at Age 11, 13 and 15, with 95% CI Reported in Parentheses.

	Age 11 Aggression				Age 13 Aggression				Age 15 Aggression			
	n= 1127				n = 1016				n = 1072			
	b	SE(*b*)	β		*b*	SE(*b*)	β		*b*	SE(*b*)	β	
Step 1:												
Constant	1.88 (1.79, 1.96)	.04			2.28 (2.16, 2.39)	.06			2.07 (1.96, 2.17)	.05		
Gender	-.22 (-.27, -.17)	.03	-.25***		-.33 (-.40, -.26)	.04	-.28***		-.24 (-.31, -.18)	.03	-.22***	
SES	.00 (-.01, .01)	.00	-.01		-.01 (-.01, -.01)	.00	-.11***		-.01 (-.01, -.01)	.00	-.09**	
R^2				.06				.09				.06
△F				37.91***				46.81***				31.04***
Step 2:												
Constant	1.45 (1.34, 1.56)	.06			2.01 (1.85, 2.17)	.08			1.82 (1.67, 1.97)	.08		
Gender	-.20 (-.25, -.15)	.03	-.23***		-.31 (-.38, -.24)	.04	-.26***		-.23 (-.29, -.17)	.03	-.21***	
SES	.01 (.01, .01)	.00	.01		-.01 (-.01, -.01)	.00	-.10**		-.01 (-.01, -01)	.00	-.09**	
CP Age 11	.33 (.26, .38)	.03	.29***		.20 (.11, .28)	.04	.14***		.19 (.11, .26)	.04	.14***	
R^2				.15				.10				.07
△F				113.10***				21.24***				22.42***
Step 3:												
Constant	2.13 (1.95, 2.31)	.09			2.66 (2.39, 2.92)	.13			2.08 (1.8, 2.32)	.12		
Gender	-.17 (-.22, -.12)	.02	-.19***		-.29 (-.35, -.22)	.04	-.24***		-.22 (-.28, -.15)	.03	-.20***	
SES	.00 (-.01, .01)	.00	-.01		-.01 (-.01, -.01)	.00	-.11***		-.01 (-.01. .01)	.00	-.09**	
CP Age 11	.28 (.22, .34)	.03	.26***		.16 (.08, .25)	.04	.11***		.17 (.09, .25)	.04	.13***	
TCR Age 11	-.19 (-.23, -.15)	.02	-.26***		-.18 (-.24, -.12)	.03	-.18***		-.07 (-.13, -.02)	.03	-.08**	
R^2				.21				.14				.08
△F				90.51***				36.77***				6.82*

Note. **p*<.05. ***p*<.01. ****p*<.001. CP = Corporal Punishment. SES = Socioeconomic Status. TCR = Teacher-child Relationship.

Table 37 Hierarchical Regression Analysis for Age 13 Teacher-Child Relationship Predicting Self-Reported Aggression at Age 13 and 15, with 95% CI Reported in Parentheses.

	Age 13 Aggression				Age 15 Aggression			
	n = 1344				n = 1308			
	b	SE(*b*)	β		*b*	SE(*b*)	β	
Step 1								
Constant	2.22 (2.1, 2.3)	.05			2.074 (1.98, 2.17)	.05		
Gender	-.32 (-.38, -.26)	.03	-.27***		-.26 (-.32, -.20)	.03	-.23***	
SES	-.01 (-.01, -.00)	.01	-.04		-.01 (-.01, -.00)	.01	-.08**	
R^2				.07				.06
△F				52.65***				39.91***
Step 2:								
Constant	1.76 (1.63, 1.89)	.07			1.74 (1.61, 1.87)	.07		
Gender	-.29 (-.35, -.24)	.03	-.25***		-.24 (-.30, -.18)	.03	-.21***	
SES	.00 (-.01, .00)	.01	-.03		-.01 (-.01, -.00)	.00	-.07**	
CP	.36	.04	.26***		.26	.04	.19***	
Age 13	(.29, .43)				(.19, .33)			
R^2				.14				.09
△F				100.83***				49.84***
Step 3:								
Constant	2.58 (2.38, 2.77)	.10			2.16 (1.96, 2.36)	.10		
Gender	-.28 (-.34, -.22)	.03	-.24***		-.23 (-.29, -.11)	.03	-.21***	
SES	-.00 (-.01, .00)	.00	-.02		-.01 (-.01, -.00)	.00	-.07**	
CP	.30	.04	.21***		.23	.04	.17***	
Age 13	(.23, .37)				(.16, .30)			
TCR	-.24	.02	-.27***		-.13	.02	-.15***	
Age 13	(-.29, -.20)				(-.17, -.08)			
R^2				.21				.11
△F				117.17***				30.22***

Note. *p<.05. **p<.01. ***p<.001. CP = Corporal Punishment. SES = Socioeconomic Status. TCR = Teacher-child Relationship.

Table 38 Hierarchical Regression Analysis for Age 15 Teacher-Child Relationship Predicting Self-Reported Aggression at Age 15, with 95% CI Reported in Parentheses.

	Age 15 Aggression			
	n = 1443			
	b	SE(*b*)	β	
Step 1				
Constant	2.08 (1.99, 2.17)	.05		
Gender	-.26 (-.31, -.20)	.03	-.23***	
SES	-.01 (-.01, -.00)	.01	-.08**	
R^2				.06
△F				45.63***
Step 2:				
Constant	1.60 (1.48, 1.72)	.06		
Gender	-.26 (-.314, -.21)	.03	-.23***	
SES	-.01 (-.01, -.00)	.01	-.06*	
CP Age 15	.41 (.34, .49)	.04	.28***	
R^2				.14
△F				124.59***
Step 3:				
Constant	2.13 (1.95, 2.30)	.09		
Gender	-.25 (-.30, -.20)	.03	-.23***	
SES	-.01 (-.01, -.00)	.01	-.07**	
CP Age 15	.38 (.30, .45)	.04	.25***	
TCR Age 15	-.16 (-.20, -.12)	.02	-.20***	
R^2				.17
△F				64.44***

Note. *p<.05. ** p<.01. *** p<.001. CP = Corporal Punishment. SES = Socioeconomic Status. TCR = Teacher-child Relationship.

Autoregressive Cross-Lagged Results: Positive Teacher-child Relationships

To test positive teacher-child relationships as an interactive protective factor, I specified the autoregressive cross-lagged panel model presented in Figure 16. Similar to Chapter 6, all predictor variables (corporal punishment and teacher-child relationships) were first centred before being entered into the model. Interaction effects were tested by using product terms created by the centred variables. The initial model did not show a good fit to the data $X^2(36) = 162.38$, p<.05, RMSEA = .06, 90% CI [0.05, 0.07], CFI = .83, TLI = .72. Modification indices were examined and

recommended including the correlational path between product terms [age 11 corporal punishment x age 13 teacher-child relationship] and [age 11 corporal punishment x age 11 teacher-child relationship]. The inclusion of this correlational path resulted in a good fit to the data $X^2(31) = 64.73$, $p<.05$, RMSEA = .03, 90% CI [0.02, 0.04], CFI = .97, TLI = .95. Results are displayed in Figure 17 with only paths relevant to moderation results displayed. All other results, including main effects, have been included in Table 39. Fully standardized parameter estimates indicate that inter-individual differences in corporal punishment ($\beta_{Age11\text{-}13} = .33$, $p<.05$ and $\beta_{Age13\text{-}15} = .37$, $p<.05$), child reported teacher-child relationships ($\beta_{Age11\text{-}13} = .26$, $p<.05$ and $\beta_{Age13\text{-}15} = .30$, $p<.05$) and aggression ($\beta_{Age11\text{-}13} = .38$, $p<.05$ and $\beta_{Age13\text{-}15} = .46$, $p<.05$) were stable over time. The results show that having a positive teacher-child relationship had significant main effects against concurrent aggression (Table 39). This suggests that having a positive relationship with a teacher acted as a direct protective factor and resulted in the young person having reduced levels of aggression within the same time point.

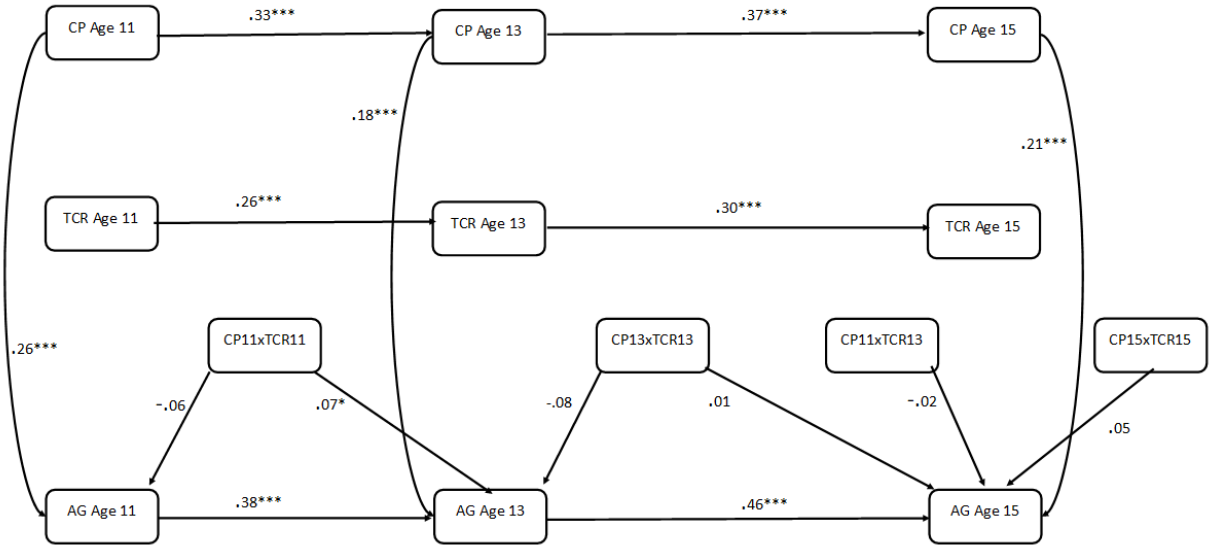
In addition to examining the main effects, the value of having a positive teacher-child relationship was tested as an interactive protective factor within the same timepoint. First, having a positive teacher-child relationship at age 11 was tested as an interactive protective factor between age 11 corporal punishment and age 11 aggression. Results indicated that having a positive teacher-child relationship at age 11 was not a significant interactive protective factor between age 11 corporal punishment and age 11 aggression ($\beta = -.06$, $p>.05$). It was also the case that, at age 13, having a positive teacher-child relationship was not found to be a significant interactive protective factor between age 13 corporal punishment and age 13 aggression ($\beta = -.08$, $p>.05$). Similarly, at age 15, having a positive teacher-child relationship was not a significant interactive protective factor between age 15 corporal punishment and age 15 aggression ($\beta = .05$, $p>.05$). Thus, while there were significant main effects between positive teacher-child relationships and reduced aggression within the same time point, the results were less consistent when testing for interactions within the same time point.

Having a positive teacher-child relationship was then tested as an interactive protective factor between corporal punishment and subsequent aggression. As indicated in Figure 17, results show that having a positive teacher-child relationship at age 11 had a significant interaction between age 11 corporal punishment and age 13 aggression for the full sample ($\beta = .07$, $p<.05$). The significant interaction effect indicates that the relationship between corporal punishment and aggression is moderated by having a positive teacher-child relationship**.** However, the direction

of the interaction suggests that higher levels of positive teacher-child relationships exacerbated the main effects of corporal punishment on subsequent aggression. As was the case in Chapter 6, simple slopes are presented for significant interactions to assist with interpreting the results. As shown in Figure 18, simple slopes suggest that those who reported higher levels of positive teacher-child relationships displayed higher levels of aggression after having been exposed to corporal punishment. However, the protective effect of positive teacher-child relationships differs depending on the degree of corporal punishment being experienced. For example, amongst those who have little exposure to corporal punishment, those with stronger relationships with their teachers had lower levels of aggression. Once a young person is exposed to higher levels of corporal punishment, the protective effect disappears and those with a stronger relationship with their teacher end up with higher levels of aggression when compared to those with a less positive relationship with their teacher. However, it is important to note that the difference is really quite small between those with higher (+1 *SD*) and lower (-1 *SD*) positive teacher-child relationships and subsequent aggression when being exposed to higher levels of corporal punishment.

Results were not consistent when considering other lagged paths across different developmental stages in adolescence. For example, results show that having a positive teacher-child relationship at age 13 was not a significant interactive protective factor between age 13 corporal punishment and age 15 aggression ($\beta = .01$, $p>.05$). Finally, the model also examined whether or not having a positive teacher-child relationship at age 13 acted as an interactive protective factor between corporal punishment at age 11 and subsequent aggression at age 15. The results indicated that having a positive relationship with a teacher at age 13 was not an interactive protective factor between age 11 corporal punishment and age 15 aggression ($\beta = -.02$, $p>.05$).

Figure 17 Autoregressive Cross-Lagged Panel Model Testing Positive Teacher-Child Relationships as an Interactive Protective Factor Between Corporal Punishment and Aggression



Note. *p<.05, **p<.01, ***p<.001. AG = Aggression. CP = Corporal Punishment. TCR = Teacher-child Relationships. Lines represent regression paths.

Figure 18 Simple Slopes Showing the Association between Age 11 Corporal Punishment and Age 13 Aggression at High (+1 *SD*) Medium (centred mean) and Low (-1 *SD*) Levels of Positive Teacher-Child Relationship for the Full Sample.

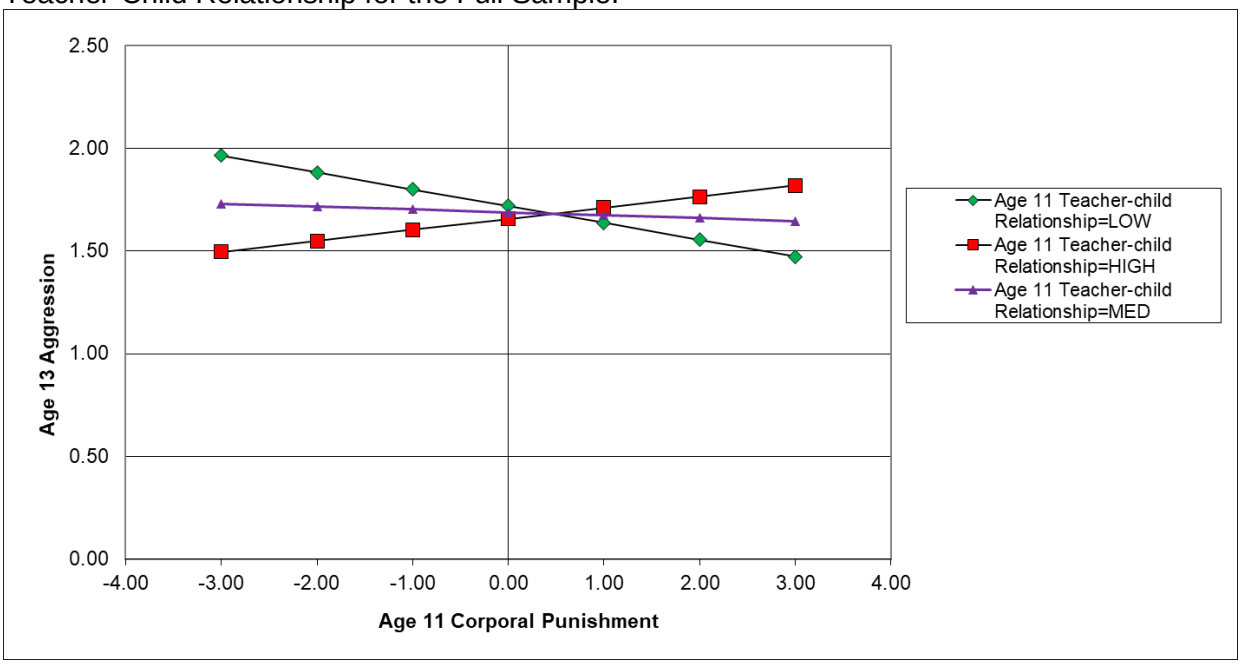


Table 39 Path Results of Autoregressive CLPM Testing Teacher-Child Relationship as an Interactive Protective Factor

	Estimate	*S.E.*	*Est./S.E.*	*Sig.*
Regression Paths				
Outcome Variable: Age 15 Aggression				
Age 13 Aggression	.456	.032	14.189	.000
Age 11 Aggression	.115	.036	3.238	.001
Age 15 Teacher-Child Relationship (Centred)	-.138	.027	-5.192	.000
Age 15 Corporal Punishment (Centred)	.206	.041	5.053	.000
Age 15 Corporal Punishment X Age 15 Teacher-Child Relationship (Product Term)	.054	.036	1.499	.134
Age 13 Corporal Punishment (Centred)	.006	.040	0.138	.890
Age 13 Teacher-Child Relationship (Centred)	.047	.026	1.805	.071
Age 13 Corporal Punishment X Age 13 Teacher-Child Relationship (Product Term)	.003	.050	0.061	.951
Age 11 Corporal Punishment (Centred)	-.001	.036	-0.040	.968
Age 11 Corporal Punishment X Age 13 Teacher-Child Relationship (Product Term)	-.023	.034	-0.692	.489
Outcome Variable: Age 13 Aggression				
Age 11 Aggression	.376	.039	9.588	.000
Age 13 Teacher-Child Relationship (Centred)	-.211	.030	-7.128	.000
Age 13 Corporal Punishment (Centred)	.175	.035	4.955	.000
Age 13 Corporal Punishment X Age 13 Teacher-Child Relationship (Product Term)	-.080	.044	-1.833	.067
Age 11 Corporal Punishment (Centred)	-.014	.033	-0.409	.683
Age 11 Teacher-Child Relationship (Centred)	-.031	.031	-0.988	.323
Age 11 Corporal Punishment X Age 11 Teacher-Child Relationship (Product Term)	.068	.030	2.231	.026
Outcome Variable: Age 15 Teacher-Child Relationship				
Age 13 Teacher-Child Relationship (Centred)	.296	.030	9.990	.000
Age 11 Teacher-Child Relationship (Centred)	.080	.032	2.478	.013
Outcome Variable: Age 13 Teacher-Child Relationship				
Age 11 Teacher-Child Relationship (Centred)	.259	.030	8.720	.000
Outcome Variable: Age 15 Corporal Punishment				
Age 13 Corporal Punishment (Centred)	.373	.043	8.747	.000
Age 11 Corporal Punishment (Centred)	.144	.044	3.246	.001
Outcome Variable: Age 13 Corporal Punishment				
Age 11 Corporal Punishment (Centred)	.327	.046	7.065	.000
Outcome Variable: Age 11 Aggression				
Age 11 Teacher-Child Relationship (Centred)	-.277	.030	-9.110	.000
Age 11 Corporal Punishment (Centred)	.256	.040	6.427	.000
Age 11 Corporal Punishment X Age 11 Teacher-Child Relationship (Product Term)	-.062	.041	-1.513	.130
Correlational Paths				
Age 11 Corporal Punishment Correlated With:				
Age 11 Teacher-Child Relationship (Centred)	-.146	.039	-3.719	.000

Age 11 Corporal Punishment X Age 11 Teacher-Child Relationship (Product Term)	-.346	.091	-3.818	.000
Age 11 Teacher-Child Relationship Correlated With:				
Age 11 Corporal Punishment X Age 11 Teacher-Child Relationship (Product Term)	.164	.061	2.671	.008
Age 13 Corporal Punishment Correlated With:				
Age 13 Teacher-Child Relationship (Centred)	-.142	.030	-4.728	.000
Age 13 Corporal Punishment X Age 13 Teacher-Child Relationship (Product Term)	-.398	.074	-5.398	.000
Age 13 Teacher-Child Relationship Correlated With:				
Age 13 Corporal Punishment X Age 13 Teacher-Child Relationship (Product Term)	.080	.048	1.645	.100
Age 15 Corporal Punishment Correlated With:				
Age 15 Teacher-Child Relationship (Centred)	-.144	.032	-4.482	.000
Age 15 Corporal Punishment X Age 15 Teacher-Child Relationship (Product Term)	-.274	.082	-3.363	.001
Age 15 Teacher-Child Relationship Correlated With:				
Age 15 Corporal Punishment X Age 15 Teacher-Child Relationship (Product Term)	.100	.048	2.080	.038
Age 13 Corporal Punishment X Age 13 Teacher-Child Relationship (Product Term) Correlated With:				
Age 11 Teacher-Child Relationship (Centred)	.113	.038	2.945	.003
Age 11 Corporal Punishment (Centred)	-.064	.047	-1.380	.168
Age 11 Corporal Punishment X Age 11 Teacher-Child Relationship (Product Term)	.086	.052	1.635	.102
Age 15 Corporal Punishment X Age 15 Teacher-Child Relationship (Product Term) Correlated With:				
Age 11 Teacher-Child Relationship (Centred)	.017	.044	.395	.693
Age 11 Corporal Punishment (Centred)	-.111	.079	-1.402	.161
Age 11 Corporal Punishment X Age 11 Teacher-Child Relationship (Product Term)	.017	.031	.552	.581
Age 13 Corporal Punishment X Age 13 Teacher-Child Relationship (Product Term)	.114	.033	3.454	.001
Age 11 Corporal Punishment X Age 13 Teacher-Child Relationship (Product Term) Correlated With				
Age 11 Teacher-Child Relationship (Centred)	.071	.036	1.981	.048
Age 11 Corporal Punishment X Age 11 Teacher-Child Relationship (Product Term)	.403	.054	7.449	.000
Age 13 Corporal Punishment X Age 13 Teacher-Child Relationship (Product Term)	.181	.071	2.543	.011
Age 15 Corporal Punishment X Age 15 Teacher-Child Relationship (Product Term)	.199	.135	1.475	.140
Age 11 Corporal Punishment (Centred)	-.277	.095	-2.900	.011

Gender Differences. To determine whether the protective capabilities of having a positive teacher-child relationship differed for males and females, a separate model was fit. The main autoregressive cross-lagged panel model displayed in Figure 16, with paths estimated freely for males and females, provided a poor fit to the data $X^2(72) = 226.25$, $p<.05$, RMSEA = .07, 90% CI [0.06, 0.07], CFI = .86, TLI = .76. The addition of the same correlational path recommended by the modification indices in the main model ([age 11 corporal punishment x age 13 teacher-child relationship] and [age 11 corporal punishment x age 11 teacher-child relationship]) resulted in a good fit to the data $X^2(62) = 108.29$, $p<.05$, RMSEA = .03, 90% CI [0.02, 0.04], CFI = .97, TLI = .93. The result of the autoregressive cross-lagged panel model for males is displayed in Figure 19 and Figure 21 for females, with paths only relevant to interactive protective factors displayed.

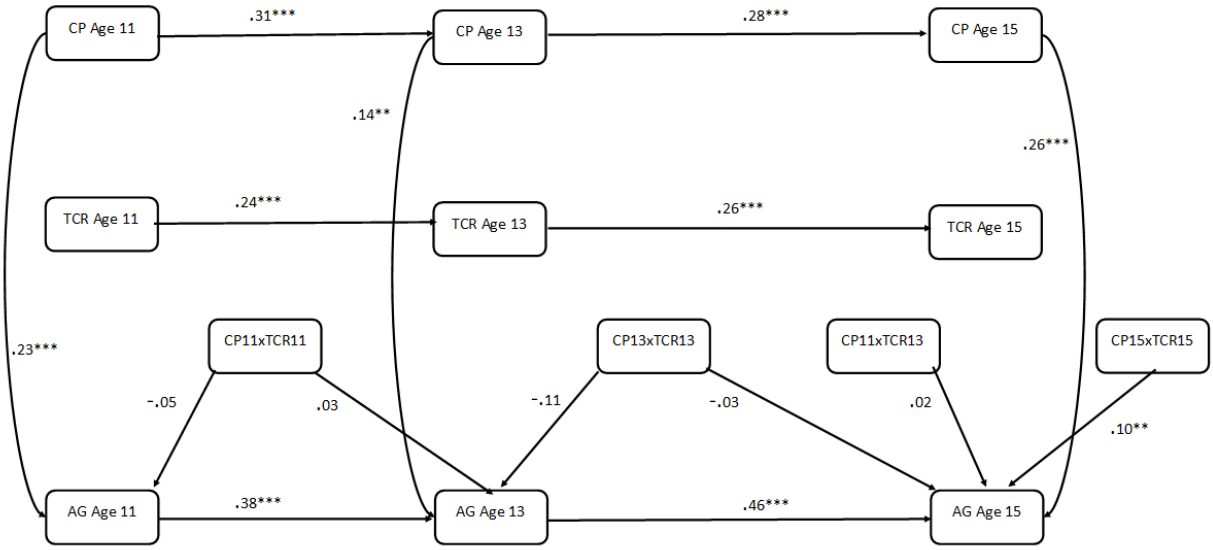
Males. Fully standardized parameter estimates indicate that inter-individual differences in teacher-child relationships ($\beta_{age11\text{-}13} = .24$, $p<.05$ and $\beta_{age13\text{-}15} = .26$, $p<.05$) corporal punishment ($\beta_{age11\text{-}13} = .31$, $p<.05$ and $\beta_{age13\text{-}15} = .28$, $p<.05$) and aggression ($\beta_{age11\text{-}13} = .38$, $p<.05$ and $\beta_{age13\text{-}15} = .46$, $p<.05$) were stable over time. As was the case with the full sample, results indicate there were significant main effects between having a positive teacher-child relationship and concurrent aggression for males (Table 40). This suggests that for males, having a strong relationship with a teacher was a direct protective factor and resulted in lower levels of aggression within the same time point. The strength of the direct protective effect differed by developmental stage. For example, the main effect was stronger for age 11 males than it was for age 15 males. This may suggest that for males, having a stronger teacher-child relationship is most important at earlier stages in adolescence.

In addition to main effects, the interactive effect of positive teacher-child relationships was also examined. Results were less consistent when testing positive teacher-child relationships as an interactive protective factor. Results show that, for males, having a positive relationship with a teacher at age 11 was not a significant interactive protective factor between age 11 corporal punishment and age 11 aggression ($\beta = -.05$, $p>.05$). Similarly, having a positive teacher-child relationship at age 13 was not found to be a significant interactive protective factor between age 13 corporal punishment and age 13 aggression ($\beta = -.11$, $p>.05$). However, for males, having a positive relationship with a teacher at age 15 was found to have a significant interaction between age 15 corporal punishment and age 15 aggression ($\beta = .10$, $p<.05$). As was the case with self-control at age 15, the direction of the interaction does not indicate a protective effect. Instead, the results suggest that having a positive relationship with a teacher at age 15 exacerbates the main

effects of corporal punishment on concurrent aggression. Although the main effects show that having a positive relationship with a teacher at age 15 is a direct protective factor, moderator results suggest that, when exposed to corporal punishment, a positive teacher-child relationship could become a risk enhancer. It is important to examine the simple slopes of this interaction to further clarify the interpretation of this result. As displayed in Figure 20, for age 15 males, if they are exposed to less corporal punishment, then having a higher (+1 *SD*) teacher-child relationship results in lower aggression. However, if a 15-year-old male is exposed to higher levels of corporal punishment, that strong relationship with their teacher results in higher levels of aggression. It is important to note that, amongst those exposed to the highest amount of corporal punishment, a 15-year-old male's relationship with their teacher appears to have very little impact on their levels of aggression. High levels of corporal punishment appear to result in similar levels of aggression for these males, regardless of the strength of their relationship with their teacher.

In addition to examining interaction effects against concurrent aggression, analyses also examined lagged effects. When considering subsequent aggression, having a positive teacher-child relationship at age 11 was not found to be a significant interactive protective factor between age 11 corporal punishment and age 13 aggression ($\beta = .03$, $p>.05$). Similarly, positive teacher-child relationships for males at age 13 was not found to be a significant interactive protective factor between age 13 corporal punishment and age 15 aggression ($\beta = -.03$, $p>.05$). The model also examined positive teacher-child relationships at age 13 as an interactive protective factor between corporal punishment at age 11 and aggression at age 15 and found no significant interaction effect ($\beta = .02$, $p>.05$).

Figure 19 Results of CLPM for Males when Testing Positive Teacher-Child Relationships as an Interactive Protective Factor



Note. *p<.05, **p<.01, ***p<.001. AG = Aggression. CP = Corporal Punishment. TCR = Teacher-child Relationships. Lines represent regression paths.

Figure 20 Simple Slopes Showing the Association between Age 15 Corporal Punishment and Age 15 Aggression at High (+1 *SD*) Medium (centred mean) and Low (-1 *SD*) Levels of Positive Teacher-Child Relationships for MALES.

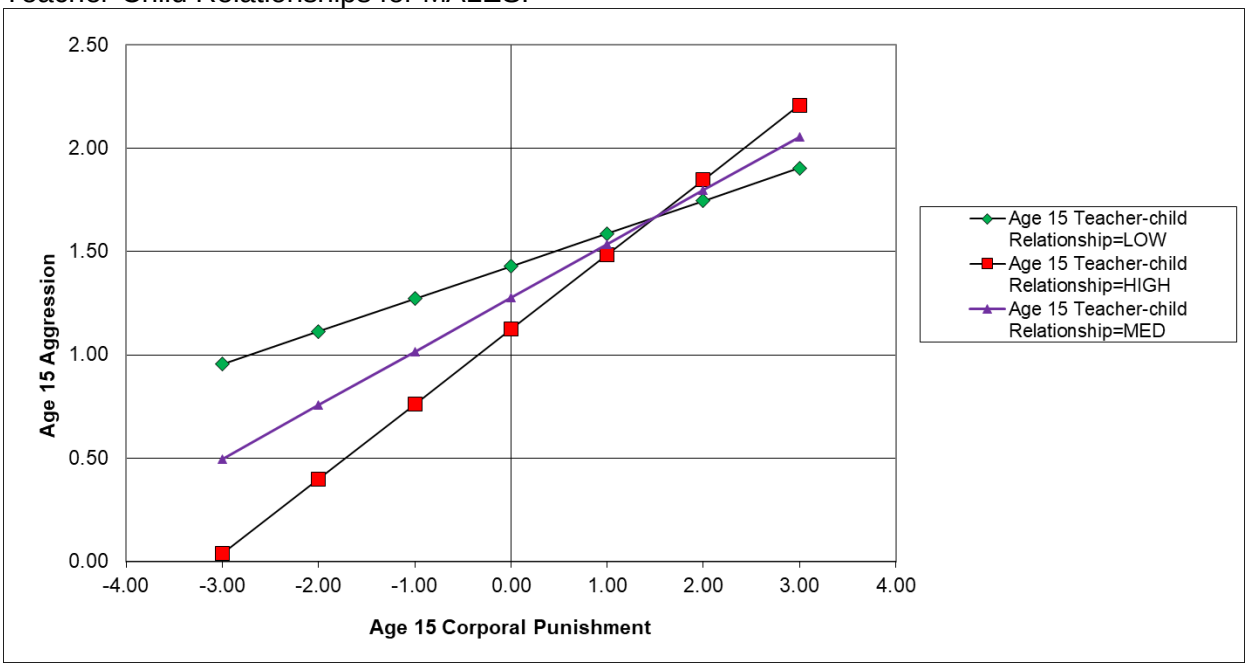


Table 40 Path Results for MALES of Autoregressive CLPM Testing Positive Teacher-Child Relationships as an Interactive Protective Factor

Males	**Estimate**	***S.E.***	***Est./S.E.***	***Sig.***
Regression Paths				
Outcome Variable: Age 15 Aggression				
Age 13 Aggression	.457	.041	11.069	.000
Age 11 Aggression	.090	.046	1.979	.048
Age 15 Teacher-Child Relationship (Centred)	-.153	.036	-4.293	.000
Age 15 Corporal Punishment (Centred)	.260	.047	5.492	.000
Age 15 Corporal Punishment X Age 15 Teacher-Child Relationship (Product Term)	.102	.039	2.598	.009
Age 13 Corporal Punishment (Centred)	-.045	.054	-0.840	.401
Age 13 Teacher-Child Relationship (Centred)	.036	.034	1.042	.297
Age 13 Corporal Punishment X Age 13 Teacher-Child Relationship (Product Term)	-.030	.063	-0.474	.635
Age 11 Corporal Punishment (Centred)	.096	.049	1.954	.051
Age 11 Corporal Punishment X Age 13 Teacher-Child Relationship (Product Term)	.017	.043	0.395	.693
Outcome Variable: Age 13 Aggression				
Age 11 Aggression	.380	.052	7.309	.000
Age 13 Teacher-Child Relationship (Centred)	-.205	.039	-5.219	.000
Age 13 Corporal Punishment (Centred)	.138	.047	2.914	.004
Age 13 Corporal Punishment X Age 13 Teacher-Child Relationship (Product Term)	-.113	.059	-1.901	.057
Age 11 Corporal Punishment (Centred)	-.030	.042	-0.721	.471
Age 11 Teacher-Child Relationship (Centred)	.013	.042	0.319	.750
Age 11 Corporal Punishment X Age 11 Teacher-Child Relationship (Product Term)	.032	.037	0.854	.393
Outcome Variable: Age 15 Teacher-Child Relationship				
Age 13 Teacher-Child Relationship (Centred)	.262	.042	6.302	.000
Age 11 Teacher-Child Relationship (Centred)	.068	.044	1.559	.119
Outcome Variable: Age 13 Teacher-Child Relationship				
Age 11 Teacher-Child Relationship (Centred)	.242	.041	5.874	.000
Outcome Variable: Age 15 Corporal Punishment				
Age 13 Corporal Punishment (Centred)	.276	.054	5.107	.000
Age 11 Corporal Punishment (Centred)	.135	.065	2.078	.038
Outcome Variable: Age 13 Corporal Punishment				
Age 11 Corporal Punishment (Centred)	.310	.063	4.938	.000
Outcome Variable: Age 11 Aggression				
Age 11 Teacher-Child Relationship (Centred)	-.300	.040	-7.439	.000
Age 11 Corporal Punishment (Centred)	.230	.056	4.103	.000
Age 11 Corporal Punishment X Age 11 Teacher-Child Relationship (Product Term)	-.049	.059	-0.838	.402
Correlational Paths				
Age 11 Corporal Punishment Correlated With:				
Age 11 Teacher-Child Relationship (Centred)	-.124	.054	-2.314	.021

Age 11 Corporal Punishment X Age 11 Teacher-Child Relationship (Product Term)	-.391	.114	-3.430	.001
Age 11 Teacher-Child Relationship Correlated With:				
Age 11 Corporal Punishment X Age 11 Teacher-Child Relationship (Product Term)	.170	.079	2.146	.032
Age 13 Corporal Punishment Correlated With:				
Age 13 Teacher-Child Relationship (Centred)	-.181	.043	-4.231	.000
Age 13 Corporal Punishment X Age 13 Teacher-Child Relationship (Product Term)	-.497	.087	-5.679	.000
Age 13 Teacher-Child Relationship Correlated With:				
Age 13 Corporal Punishment X Age 13 Teacher-Child Relationship (Product Term)	.169	.059	2.848	.004
Age 15 Corporal Punishment Correlated With:				
Age 15 Teacher-Child Relationship (Centred)	-.146	.042	-3.495	.000
Age 15 Corporal Punishment X Age 15 Teacher-Child Relationship (Product Term)	-.347	.085	-4.094	.000
Age 15 Teacher-Child Relationship Correlated With:				
Age 15 Corporal Punishment X Age 15 Teacher-Child Relationship (Product Term)	.056	.068	.821	.412
Age 11 Corporal Punishment X Age 13 Teacher-Child Relationship (Product Term) Correlated With:				
Age 11 Teacher-Child Relationship (Centred)	.119	.048	2.460	.014
Age 11 Corporal Punishment (Centred)	-.268	.127	-2.108	.035
Age 11 Corporal Punishment X Age 11 Teacher-Child Relationship (Product Term)	.455	.063	7.175	.000
Age 13 Corporal Punishment X Age 13 Teacher-Child Relationship (Product Term)	.127	.082	1.543	.123
Age 15 Corporal Punishment X Age 15 Teacher-Child Relationship (Product Term)	.243	.176	1.380	.167
Age 13 Corporal Punishment X Age 13 Teacher-Child Relationship (Product Term) Correlated With:				
Age 11 Teacher-Child Relationship (Centred)	.120	.049	2.452	.014
Age 11 Corporal Punishment (Centred)	-.069	.058	-1.197	.231
Age 11 Corporal Punishment X Age 11 Teacher-Child Relationship (Product Term)	.045	.065	.702	.483
Age 15 Corporal Punishment X Age 15 Teacher-Child Relationship (Product Term) Correlated With				
Age 11 Teacher-Child Relationship (Centred)	.014	.029	.475	.635
Age 11 Corporal Punishment X Age 11 Teacher-Child Relationship (Product Term)	-.224	.103	-2.170	.030
Age 13 Corporal Punishment X Age 13 Teacher-Child Relationship (Product Term)	.019	.036	.519	.604
Age 11 Corporal Punishment (Centred)	.142	.035	4.019	.000

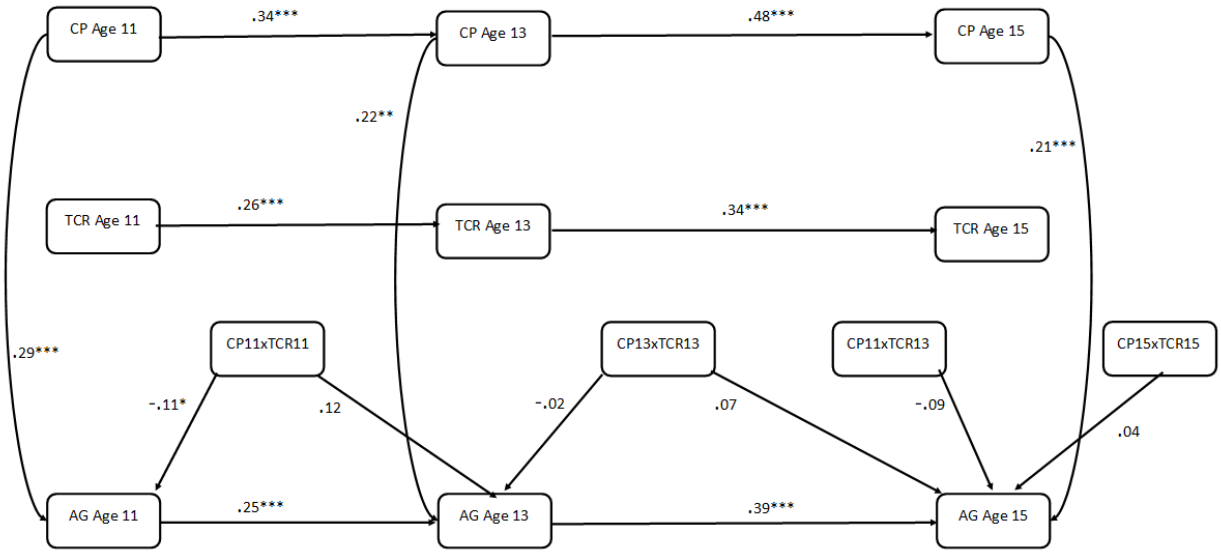
Females. Similar to the previous models, fully standardized parameter estimates indicate that inter-individual differences in teacher-child relationships ($\beta_{age11\text{-}13} = .26$, $p<.05$ and $\beta_{age13\text{-}15} = .34$, $p<.05$) corporal punishment ($\beta_{age11\text{-}13} = .34$, $p<.05$ and $\beta_{age13\text{-}15} = .48$, $p<.05$) and aggression ($\beta_{age11\text{-}13} = .25$, $p<.05$ and $\beta_{age13\text{-}15} = .39$, $p<.05$) were stable over time. As was the case for males, main effects between positive teacher-child relationships and concurrent aggression for females were significant across all age groups. As discussed, for males, the strongest main effect was for younger students (age 11) and the weakest was for older students (age 15). However, the results were different for females. The strongest main effect between positive teacher-child relationships and concurrent aggression for females was age 13, with the weakest being age 15. It is also interesting to note that the strength of the main effects were lower for females than males, which contradicts previous research (Birch & Ladd, 1997).

Having a positive teacher-child relationship at age 11 was tested as an interactive protective factor between age 11 corporal punishment and age 11 aggression. Results indicated that for females, having a positive teacher-child relationship at age 11 was a significant interactive protective factor between age 11 corporal punishment and age 11 aggression ($\beta = -.11$, $p<.05$). This indicates that, for females, having a positive relationship with a teacher at age 11 protected against adverse effects of corporal punishment at age 11. In other words, 11-year-old females with stronger positive teacher-child relationships had lower levels of aggression when exposed to corporal punishment. As displayed in Figure 22, results show similar levels of aggression for 11-year-old females exposed to very little corporal punishment, irrespective of the strength of their relationship with their teacher. However, when exposed to higher levels of corporal punishment, those with less positive relationships with their teachers had higher levels of aggression. Results differed when examining the protective effect of positive teacher-child relationships for older females. For example, for females, having a positive relationship with a teacher at age 13 was not a significant interactive protective factor between age 13 corporal punishment and age 13 aggression ($\beta = -.02$, $p>.05$). This was also the case for 15-year-old females ($\beta = .04$, $p>.05$).

When considering subsequent aggression, having a positive teacher-child relationship at age 11 was not a significant interactive protective factor between age 11 corporal punishment and age 13 aggression ($\beta = .12$, $p>.05$). Similarly, having a positive teacher-child relationship at age 13 was not found to be a significant interactive protective factor between age 13 corporal punishment and age 15 aggression ($\beta = .07$, $p>.05$) which was the same for the males. Finally, as was the case for the males, the results indicated that for females, having a positive teacher-child

relationship at age 13 was not found to be a significant interactive protective factor between age 11 corporal punishment and age 15 aggression (β = -.09, *p*>.05).

Figure 21 Results of Autoregressive CLPM for Females when Testing Positive Teacher-Child Relationships as an Interactive Protective Factor



Note. *p<.05, **p<.01, ***p<.001. AG = Aggression. CP = Corporal Punishment. TCR = Teacher-child Relationships. Lines represent regression paths.

Figure 22 Simple Slopes Showing the Association Between Age 11 Corporal Punishment and Age 11 Aggression at High (+1 *SD*) Medium (centred mean) and Low (-1 *SD*) Levels of Positive Teacher-Child Relationship for FEMALES

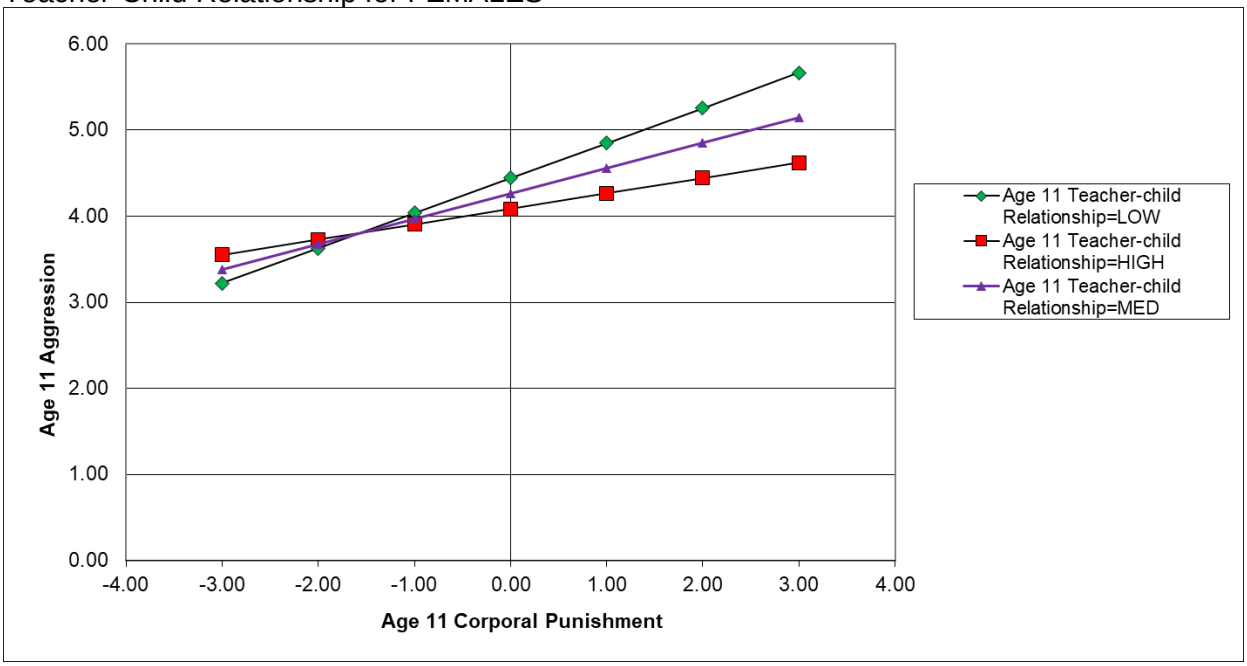


Table 41 Path Results for FEMALES of Autoregressive CLPM Testing Positive Teacher-Child Relationships as an Interactive Protective Factor

Females	**Estimate**	***S.E.***	***Est./S.E.***	***Sig.***
Regression Paths				
Outcome Variable: Age 15 Aggression				
Age 13 Aggression	.385	.051	7.542	.000
Age 11 Aggression	.108	.054	1.999	.046
Age 15 Teacher-Child Relationship (Centred)	-.117	.039	-2.991	.003
Age 15 Corporal Punishment (Centred)	.211	.061	3.489	.000
Age 15 Corporal Punishment X Age 15 Teacher-Child Relationship (Product Term)	.043	.059	0.735	.463
Age 13 Corporal Punishment (Centred)	.076	.057	1.330	.184
Age 13 Teacher-Child Relationship (Centred)	.056	.040	1.393	.164
Age 13 Corporal Punishment X Age 13 Teacher-Child Relationship (Product Term)	.073	.064	1.138	.255
Age 11 Corporal Punishment (Centred)	-.138	.049	-2.813	.005
Age 11 Corporal Punishment X Age 13 Teacher-Child Relationship (Product Term)	-.092	.050	-1.860	.063
Outcome Variable: Age 13 Aggression				
Age 11 Aggression	.252	.054	4.715	.000
Age 13 Teacher-Child Relationship (Centred)	-.241	.047	-5.099	.000
Age 13 Corporal Punishment (Centred)	.218	.056	3.896	.000
Age 13 Corporal Punishment X Age 13 Teacher-Child Relationship (Product Term)	-.024	.050	-0.477	.663
Age 11 Corporal Punishment (Centred)	.017	.059	0.286	.775
Age 11 Teacher-Child Relationship (Centred)	-.077	.049	-1.559	.119
Age 11 Corporal Punishment X Age 11 Teacher-Child Relationship (Product Term)	.117	.063	1.849	.064
Outcome Variable: Age 15 Teacher-Child Relationship				
Age 13 Teacher-Child Relationship (Centred)	.335	.042	8.064	.000
Age 11 Teacher-Child Relationship (Centred)	.080	.051	1.572	.116
Outcome Variable: Age 13 Teacher-Child Relationship				
Age 11 Teacher-Child Relationship (Centred)	.261	.042	6.185	.000
Outcome Variable: Age 15 Corporal Punishment				
Age 13 Corporal Punishment (Centred)	.478	.059	8.167	.000
Age 11 Corporal Punishment (Centred)	.161	.060	2.675	.007
Outcome Variable: Age 13 Corporal Punishment				
Age 11 Corporal Punishment (Centred)	.336	.068	4.930	.000
Outcome Variable: Age 11 Aggression				
Age 11 Teacher-Child Relationship (Centred)	-.179	.044	-4.079	.000
Age 11 Corporal Punishment (Centred)	.293	.054	5.386	.000
Age 11 Corporal Punishment X Age 11 Teacher-Child Relationship (Product Term)	-.114	.047	-2.444	.015
Correlational Paths				
Age 11 Corporal Punishment Correlated With:				

Age 11 Teacher-Child Relationship (Centred)	-.155	.059	-2.639	.008
Age 11 Corporal Punishment X Age 11 Teacher-Child Relationship (Product Term)	-.268	.149	-1.806	.071
Age 11 Teacher-Child Relationship Correlated With:				
Age 11 Corporal Punishment X Age 11 Teacher-Child Relationship (Product Term)	.157	.094	1.670	.095
Age 13 Corporal Punishment Correlated With:				
Age 13 Teacher-Child Relationship (Centred)	-.096	.039	-2.475	.013
Age 13 Corporal Punishment X Age 13 Teacher-Child Relationship (Product Term)	-.233	.099	-2.352	.019
Age 13 Teacher-Child Relationship Correlated With:				
Age 13 Corporal Punishment X Age 13 Teacher-Child Relationship (Product Term)	-.050	.071	-.710	.477
Age 15 Corporal Punishment Correlated With:				
Age 15 Teacher-Child Relationship (Centred)	-.141	.049	-2.895	.004
Age 15 Corporal Punishment X Age 15 Teacher-Child Relationship (Product Term)	-.238	.134	-1.774	.076
Age 15 Teacher-Child Relationship Correlated With:				
Age 15 Corporal Punishment X Age 15 Teacher-Child Relationship (Product Term)	.147	.066	2.240	.025
Age 11 Corporal Punishment X Age 13 Teacher-Child Relationship (Product Term) Correlated With:				
Age 11 Teacher-Child Relationship (Centred)	-.011	.059	-.192	.847
Age 11 Corporal Punishment (Centred)	-.284	.142	-1.999	.046
Age 11 Corporal Punishment X Age 11 Teacher-Child Relationship (Product Term)	.285	.119	2.386	.017
Age 13 Corporal Punishment X Age 13 Teacher-Child Relationship (Product Term)	.269	.089	3.014	.003
Age 15 Corporal Punishment X Age 15 Teacher-Child Relationship (Product Term)	.089	.058	1.536	.125
Age 13 Corporal Punishment X Age 13 Teacher-Child Relationship (Product Term) Correlated With:				
Age 11 Teacher-Child Relationship (Centred)	.065	.044	1.451	.147
Age 11 Corporal Punishment (Centred)	-.055	.073	-0.765	.445
Age 11 Corporal Punishment X Age 11 Teacher-Child Relationship (Product Term)	.132	.069	1.912	.056
Age 15 Corporal Punishment X Age 15 Teacher-Child Relationship (Product Term) Correlated With				
Age 11 Teacher-Child Relationship (Centred)	.025	.115	.220	.826
Age 11 Corporal Punishment X Age 11 Teacher-Child Relationship (Product Term)	.014	.070	.200	.841
Age 13 Corporal Punishment X Age 13 Teacher-Child Relationship (Product Term)	.050	.070	.723	.470
Age 11 Corporal Punishment (Centred)	.076	.062	1.218	.223

Discussions and Conclusions

As discussed in Chapter 3, research has found that having a positive relationship with a teacher is an important part of a young person's development (Sabol & Pianta, 2012; Silver et al., 2005). In addition to contributing to positive school adjustment and academic achievement, having a positive teacher-child relationship can also act as a direct protective factor (Vassallo et al., 2016) when exposed to certain risks. However, less is known about the protective capabilities of positive teacher-child relationships against adolescent aggression after being exposed to corporal punishment. The analyses in Chapter 5 show that exposure to corporal punishment was a significant predictor of aggression even after previous levels of aggression were accounted for. These findings supported the claim that those who experienced corporal punishment were significantly more likely to develop increased aggression two years after. However, it remains the case that not all young people who experience corporal punishment go on to develop increased aggression which suggests a protective factor may be present. Therefore, the purpose of this chapter was to investigate the possibility that having a positive teacher-child relationship could act as an interactive protective factor between corporal punishment and aggression. This study hypothesised that having a positive teacher-child relationship would act as both a direct protective factor as well as an interactive protective factor between corporal punishment and aggression.

Within the current study, when examining correlations between positive teacher-child relationships and levels of aggression, it was found that having a positive teacher-child relationship at ages 11, 13 and 15 was significantly associated with lower levels of aggression across all ages. The strongest association was found within time points. This is in line with previous research which found that positive relationships with teachers resulted in lower levels of antisocial behaviour (Tiet, Huizinga, & Byrnes, 2010; Hamre & Pianta, 2001). Previous research has also found that young people with higher levels of aggression are less likely to develop a positive relationship with their teachers (Doumen et al., 2008). Within the hierarchical regression analyses, result show that having a positive teacher-child relationship at age 11 predicted lower levels of aggression at ages 11, 13 and 15 for the full sample. This was also the case for positive teacher-child relationships at age 13 which predicted lower levels of aggression at ages 13 and 15. Finally, positive teacher-child relationships at age 15 predicted lower levels of aggression at age 15. Within the autoregressive cross-lagged panel model, significant main effects were found between positive teacher-child relationships and concurrent aggression after accounting for previous levels of aggression. This is important to note as it suggests that, regardless of whether

or not a young person is exposed to corporal punishment, having a positive relationship with a teacher is a direct protective factor and worth developing.

The autoregressive cross-lagged panel model was also used to test the hypothesis that having a positive teacher-child relationship would act as an interactive protective factor between corporal punishment and aggression while accounting for previous levels of aggression. It was found that, for the full sample, having a positive relationship with a teacher at age 11 had a significant interaction between corporal punishment experienced at age 11 and subsequent aggression at age 13. However, the direction of the interaction initially suggested that this positive relationship with a teacher exacerbated the effects of corporal punishment. After examining the simple slopes, it became clear that the level of aggression differed very slightly for those exposed to high corporal punishment, regardless of the strength of the teacher-child relationship.

When examining gender differences, this study found significant associations between gender and positive teacher-child relationships at ages 11 and 13. This suggests that females were more likely to experience stronger positive relationships with their teachers at ages 11 and 13 when compared with males which is consistent with previous research (e.g. Birch & Ladd, 1997). However, when examining the main effects from the autoregressive cross-lagged panel model, the main effects between positive teacher-child relationships and concurrent aggression were stronger for males when compared to females. This suggests that for males, having a positive relationship with a teacher had a stronger direct protective effect against aggression than it did for females. In other words, the main effects between positive teacher-child relationships were weaker for females, even though they reported stronger relationships with teachers when compared to males. This suggests that for males, even having a weak overall relationship with a teacher can have a positive effect with reduced aggression. Future studies should continue to investigate the different dynamics between teachers and male and female student relationships.

This study also considered the interactive protective effect of positive teacher-child relationships separately for males and females. Having a positive teacher-child relationship at age 11 was found to be an interactive protective factor for females, but not for males. For 11-year-old females, having a stronger relationship with a teacher protected against the adverse effects of corporal punishment. This finding is in support of my hypothesis that having a positive teacher-child relationship can act as an interactive protective factor between corporal punishment and aggression. The results of this interaction are in line with previous research which found that having a supportive relationship with a teacher acts as an interactive protective factor (Vassallo et al., 2016). This finding also contributes to the study of protective factors as it highlights the

effect that having a positive teacher-child relationship can have on reducing levels of aggression after being exposed to corporal punishment. This is important when considering intervention studies which have shown success in altering adolescent bonds with teachers (Hawkins, Catalano, & Arthur, 2002; Tiet et al., 2010).

Gender differences were also found when examining the protective effect of positive teacher-child relationships at age 15. For 15-year-old males, having a positive teacher-child relationship was found to have a significant interaction between corporal punishment at age 15 and concurrent aggression. The direction of the interaction suggests that at this age, having a positive teacher-child relationship did not protect against the adverse effect of corporal punishment, but instead exacerbated it. Previous research has found that the protective effect of a variable can differ depending on the degree of risk the young person is exposed to (e.g. Dubow et al., 2016). This is evident when examining this significant interaction for males. For example, the results show that for 15-year-old males, having a positive relationship with a teacher is a protective factor for those who have been exposed to low levels of corporal punishment. However, when a 15-year-old male is exposed to higher levels of corporal punishment, the protective capability of a positive teacher-child relationship is reduced, and levels of aggression are similar to those who have a poor relationship with their teachers.

It does remain the case that 15-year-old males who have a stronger positive relationship with a teacher have higher levels of aggression when exposed to higher levels of corporal punishment. One possible explanation could be related to Strain Theory and the frustration-aggression hypothesis. As discussed in Chapter 2, in some cases, an individual will fear being punished for overt aggression and avoid responding with overt aggression to the source of their frustration (i.e. their parents). This sometimes leads to responses to frustrations being displaced. For example, the individual who is experiencing the frustration may respond by taking out their aggression on someone other than the frustrater (Krahé, 2001). Furthermore, the Excitement Transfer Theory suggests that an individual's aggression could be triggered by a person who is unrelated to the original source of the negative arousal (Zillman & Bryant, 1974). Perhaps the effect of corporal punishment on aggression is exacerbated amongst 15-year-old males with stronger relationships with their teachers because this positive relationship gives them a sense of confidence and security to act out aggressively without fear of being physically punished for their overt aggression. The young person is still displacing their frustrations on their peers, however, because they have a stronger relationship with their teacher, they see the benefits of acting aggressively (release frustration) outweighing the costs (getting punished). This potential risk

enhancing interaction highlights the importance of examining positive teacher-child relationships in more detail with regards to the impact it might have on subsequent aggression.

The results found in this chapter suggest that the protective effect of having a positive teacher-child relationship can differ depending on gender, the degree of risk and the developmental stage of the adolescent. Previous research has also found that protective factors can have differing protective effects based on the developmental stage and degree of risk a young person is exposed to (e.g. Dubow et al., 2016; Jolliffe et al., 2016; Kim et al., 2016; Ttofi, Farrington, Piquero, Lösel, et al., 2016). For example, in this study results show that having a positive teacher-child relationship was a direct protective factor against concurrent levels of aggression, but not subsequent aggression. The strength of the direct protective effect was weaker for females, even though they reported having stronger relationships with teachers than did males. Having a positive teacher-child relationship at age 11 protected against subsequent aggression at age 13 for those who were exposed to lower levels of corporal punishment at age 11; however, the protective effect was not evident for those exposed to higher levels of corporal punishment. Furthermore, a significant interaction effect was not found at different stages of adolescence in the full sample. Having a positive teacher-child relationship was an interactive protective factor for females at age 11, and for males at age 15. However, for age 11 females, the protective effect of a positive teacher-child relationship was stronger for those who were exposed to high levels of corporal punishment. For age 15 males, the protective effect of a positive teacher-child relationship was only evident for those exposed to lower levels of corporal punishment. These findings are important to consider when developing interventions which strive to reduce levels of aggression amongst those exposed to corporal punishment.

Chapter 8: Summary of Findings and Final Conclusions

Introduction

Based on data collected using a European sample between the ages of 11 and 15, this study examined associations between parental use of corporal punishment and the impact on adolescent aggression. This was completed using an autoregressive cross-lagged panel model which allowed analyses to account for previous levels of aggression and identify causal relations. This study hypothesised that 1) there would be evidence of an intergenerational transmission of corporal punishment, 2) there would be a significant main effect between corporal punishment and subsequent aggression and 3) interactive protective factors such as self-control and positive teacher-child relationships would protect against the negative effects of corporal punishment, such as increased aggression. This chapter summarises the main findings and identifies future directions, extensions and recommendations throughout the discussion.

Summary of Main Findings

Although corporal punishment declines as children grow older (Straus & Stewart, 1999) there is evidence that it does still take place throughout adolescence. For example, in the current study, 35% of 11-year-olds reported experiencing corporal punishment at least once in the previous 12 months. Prevalence rates did show a decline as adolescents got older; however, they were still high enough to be included in the analyses with 29% experiencing corporal punishment at age 13 and 24% at age 15. In addition to males being more likely to report increased exposure to corporal punishment and higher levels of aggression, this study also found that those from lower socioeconomic backgrounds had stronger associations with aggression. However, the association between socioeconomic status and aggression was found to increase as the young person got older. Furthermore, results indicate that those from a lower socioeconomic status had a higher probability of experiencing corporal punishment.

Main effects between corporal punishment and subsequent aggression were examined by administering an autoregressive cross-lagged panel model. The results show a lagged effect between corporal punishment and aggression with higher levels of corporal punishment at age 11 predicting higher levels of aggression at age 15. This finding is in line with previous research (e.g. Berlin et al., 2009; Gershoff, 2002; Lansford et al., 2011). As the autoregression accounts for previous levels of aggression, these results show that it is the impact of age 11 corporal punishment which resulted in increased aggression at age 15, rather than 15-year-olds simply

displaying more aggression in general. The analyses of main effects were split by gender, with differences being found for males and females. Gender differences were also found within previous research discussed in Chapter 2. For example, Evans et al. (2012) found that corporal punishment was associated with delinquency and hostile views of relationships for males. However, for females, corporal punishment was only associated with hostile views of relationships. These results suggest that future research should further investigate the different impact of corporal punishment on males and females in more detail.

In addition to examining the main effects between corporal punishment and adolescent aggression, this study also sought to test the hypothesis that self-control moderates the association between corporal punishment and aggression. It was hypothesised that children with higher levels of self-control would be more protected against the adverse effects of corporal punishment. This is because previous research has found that those with higher levels of self-control are more able to regulate their emotions and less likely to display problem behaviours (Gottfredson & Hirschi, 1990). Results show that males had higher levels of low self-control than females across all age groups, which is in line with previous research (Gottfredson & Hirschi, 1990). The results show that both self-control and having a positive teacher-child relationship were direct protective factors against concurrent aggression. However, the interactive protective effect of these factors differed depending on the stage of adolescence and levels of exposure to risk. Furthermore, differences were found when considering males and females. A summary of findings is included in Table 42. When examining self-control as an interactive protective factor, within the autoregressive cross-lagged panel model, results show that higher levels of self-control at age 11 protected against the adverse effects of age 11 corporal punishment on age 11 aggression. This suggests that at the age of 11, lower levels of low self-control acted as an interactive protective factor. Gender differences were also found when examining self-control as an interactive protective factor between corporal punishment and aggression. For males, age 11 self-control was found to be an interactive protective factor; however, at age 15, it was found that reduced levels of low self-control exacerbated the effects of corporal punishment. This means that at age 15 for males, when you have lower levels of low self-control, the effects of corporal punishment on increasing aggression were more severe. For females, results show that those with higher levels of low self-control at age 13 actually had less aggression at age 15 after being exposed to corporal punishment. Gender differences have also been found within previous research. For example, as discussed in Chapter 6, Chang et al. (2010) found that lack of self-control mediated the effects of corporal punishment for males; however, for females, self-control

was not a mediator. Although the study by Chang et al. (2010) considers self-control as a mediator and not a moderator, it still provides evidence of self-control having a different effect for males and females.

Having a positive teacher-child relationship was also examined as a potential interactive protective factor between corporal punishment and aggression. Results show that the average level of positive teacher-child relationships decreased as adolescents got older. Furthermore, females were shown to have higher levels of positive teacher-child relationships when compared to males, across all age groups which is consistent with previous research (Birch & Ladd, 1997). When testing positive teacher-child relationships as an interactive protective factor, the autoregressive cross-lagged panel model showed that having a positive teacher-child relationship at age 11 was a protective factor for females between age 11 corporal punishment and aggression. However, for males, the results show that at age 15, a positive teacher-child relationship actually exacerbated the negative effects of age 15 corporal punishment and on age 15 aggression. When considering the full sample, it was found that those with higher levels of positive teacher-relationships at age 11 had higher levels of aggression at age 13 after being exposed to corporal punishment at age 11. Previous research has found that having a positive teacher-child relationship can act as a protective factor against developing problem behaviours (e.g. Pianta & Stuhlman, 2004; Silver et al., 2005; Vassallo et al., 2016). For example, as discussed in Chapter 3, Vassallo et al. (2016) found that positive teacher-child relationships protected against subsequent violence years later. Other studies have found that having a positive teacher-child relationship can result in developing positive affect and being able to have healthy interactions with peers (Hughes et al., 1999). Findings from this thesis also support the argument that positive teacher-child relationships can have both direct and interactive protective effects against aggression and when exposed to corporal punishment.

Table 42: Summary of Main Moderation Results

	Age	Protective or Risk Enhancer	Degree of Exposure to Risk	Level of Protective factor
Self-Control				
Full Sample	Age 11 CP Age 11 SC Age 11 AG	Protective Factor	Regardless of the level of exposure to corporal punishment, higher levels of self-control resulted in lower levels of aggression.	Higher levels of self-control protected against increased aggression when exposed to corporal punishment.
Males	Age 11 CP Age 11 SC Age 11 AG	Protective Factor	Regardless of the level of exposure to corporal punishment, higher levels of self-control resulted in lower levels of aggression.	Higher levels of self-control protected against increased aggression when exposed to corporal punishment.
Males	Age 15 CP Age 15 SC Age 15 AG	Risk Enhancer	Low exposure to corporal punishment → self-control was a protective factor. High exposure to corporal punishment → self-control was not a protective factor.	Levels of aggression were the same irrespective of the level of self-control when exposed to high levels of corporal punishment.
Females	Age 11 CP Age 13 SC Age 15 AG	Risk Enhancer	The exposure of corporal punishment at age 11 does not make a difference for those with high self-control. The level of aggression at age 15 stayed the same regardless of exposure.	Even though those with high self-control have the same amount of aggression regardless of exposure, they still have less aggression than those with low self-control who were exposed to less corporal punishment.
Teacher-Child Relationship				
Full Sample	Age 11 CP Age 11 TCR Age 13 AG	Risk Enhancer	Those with little exposure to corporal punishment and stronger teacher-child relationships had lower aggression. Once a young person is exposed to higher levels of corporal punishment, the protective effect disappears and those with a stronger relationship with their teacher have higher levels of aggression.	Higher levels of a teacher-child relationship resulted in higher levels of aggression when exposed to more corporal punishment.
Males	Age 15 CP Age 15 TCR Age 15 AG	Risk Enhancer	Those with little exposure to corporal punishment and stronger teacher-child relationships had lower aggression. For those exposed to higher corporal punishment, having a stronger teacher-child relationship resulted in slightly more aggression.	Those with a stronger teacher-child relationship had less aggression when exposed to little corporal punishment. When exposed to more corporal punishment, levels of aggression were similar to those with weaker teacher-child relationships.
Females	Age 11 CP Age 11 TCR Age 11 AG	Protective Factor	There were similar levels of aggression for 11-year-old females exposed to very little corporal punishment, irrespective of the strength of the teacher-child relationship. When exposed to higher levels of corporal punishment, weaker teacher-child relationships resulted in higher levels of aggression	Having a strong positive teacher-child relationship protected against the adverse effects of corporal punishment.

Discussion of Main Findings

Intergenerational Transmission of Corporal Punishment. Previous research has found that parents who experienced corporal punishment while they were children, were often likely to also administer it to their own children (Muller et al., 1995; Niu et al., 2018). As discussed in Chapter 2, this is referred to as the intergenerational transmission of corporal punishment. Evidence of an intergenerational transmission of corporal punishment is important to consider in the context of social information processing and increased adolescent aggression. For example, previous research has found that corporal punishment increases adolescent aggression through the process of developing negative social information processing (e.g. Bliesener & Losel, 2001; Calvete & Orue, 2012). Negative social information processing is then a predictor of parental use of corporal punishment which then continues the cycle of aggression (McElroy & Rodriguez, 2008). In this study, evidence of an intergenerational transmission of corporal punishment was found with parental exposure to corporal punishment being a significant predictor of them administering corporal punishment to their own children. Additionally, this study also found a significant cross-lagged main effect between corporal punishment experienced at age 11, and subsequent aggression at age 15. This suggest that higher levels of corporal punishment at age 11 predicted higher levels of aggression four years later. Evidence of an intergenerational transmission of corporal punishment alongside evidence of lagged main effects of corporal punishment on subsequent aggression support the cycle of corporal punishment and aggression proposed in Chapter 2. This finding also highlights the importance of developing research that seeks to identify interactive protective factors between corporal punishment and aggression, as a means to disrupt this cycle for future generations.

Gender Differences with Main Effects. This thesis has found gender differences with regards to experiences of corporal punishment, levels of aggression and the impact of protective factors, which is in line with previous research (e.g. Coie & Dodge, 1988; Loeber & Stouthamer-Loeber, 1998). For example, within the current study, males reported higher levels of both corporal punishment and aggression across all age groups when compared to females. This is consistent with previous research which also found males were significantly more likely to report experiencing corporal punishment (Gershoff, 2002) and also were found to have higher levels of aggression (Mendez, Durtschi, Neppl, & Stith, 2016). When examining the main effects of corporal punishment on subsequent aggression, results show that males had a significant cross-lagged main effect between age 11 corporal punishment and age 15 aggression. However, a significant

cross-lagged main effect was not found for females. Instead, the significant path was from age 13 corporal punishment and age 15 aggression. It could be the case that for those females who experienced corporal punishment at age 11, they were more likely to internalise their behaviours and withdraw or experience depression rather than act out aggressively. However, once they became older and continued to experience corporal punishment at the age of 13, they were more likely to externalise their emotions and their overall behaviour became more aggressive by the age of 15. For example, according to Evans, Simons, & Simons (2012), evidence suggests that females who are exposed to corporal punishment are more likely to respond with internalized feelings such as depression instead of aggression.

Another interesting difference between males and females is with regards to bidirectional associations between corporal punishment and aggression. For males, no significant bidirectional path was identified; however, for females, a significant path from age 13 aggression to age 15 corporal punishment was identified. It would be interesting for future research to further investigate the reasons why female aggression was more likely to result in corporal punishment at a later age, when compared to males. One reason might be because of the fact that males are known to be more aggressive than females in general, so this type of behaviour is considered more 'normalised' for males (e.g. Gottfredson & Hirschi, 1990). However, for females, part of the process of socialisation is that females display less aggression than males. Perhaps because female aggression is not considered to be 'normal', they are more likely to incite corporal punishment as a means to correct this non-normalised behaviour.

Adolescent Aggression and Main Effects. When examining interactive protective factors, it is also important to consider main effects as these could be an indication of a direct protective factor. As discussed in Chapter 3, a direct protective factor is a variable that predicts a low probability of aggression without taking other factors into account (Lösel & Farrington, 2012; Ttofi, Farrington, Piquero, Lösel, et al., 2016). Across the empirical chapters, there are consistent main effects for both self-control and for positive teacher-child relationships. When considering adolescent aggression at age 11, age 13 and age 15, both self-control and having a positive teacher-child relationship were found to be direct protective factors. This suggests that increased levels of positive teacher-child relationships and decreased levels of low self-control resulted in lower levels of concurrent aggression across all ages. This was also the case when examining main effects split by gender. These main effects are important to consider as it demonstrates that, irrespective of your experience with corporal punishment, developing high levels of self-control

and having a positive teacher-child relationship is worth promoting when trying to reduce levels of adolescent aggression.

Previous research has found that the strength of a direct protective factor can differ depending on the stage of development of the young person (e.g. Dubow et al., 2016; Kim et al., 2016). This was evident within the current study. Results show that both self-control and a positive teacher-child relationship had the strongest main effect with reduced levels of aggression at age 11 with the weakest main effect at age 15. This was also the case for males when gender differences were examined. However, for females, both self-control and having a positive teacher-child relationship had the strongest main effect against reduced aggression at age 13 and the weakest main effect was at age 15. In addition to there being gender differences with regards to the strength of main effects across developmental stages, there were also differences between males and females within the same timepoint. For example, self-control had a stronger main effect for females at ages 15 and 13; however, the main effect was stronger for males at age 11. With regards to teacher-child relationships, main effects were stronger for males at ages 15 and 11, but stronger for females at age 13. This is important to consider because not only does it suggest that the effect of these direct protective factors differ by developmental stage, but they also differ between males and females. This is an important point to keep in mind when considering future intervention programmes.

Corporal Punishment and Interaction Effects. Previous research has also found that it is sometimes the case that one single variable does not act as an interactive protective factor across all developmental stages in adolescence (Kim et al., 2016). This was also the case in the current thesis. While both self-control and having a positive teacher-child relationship were found to be direct protective factors across all ages, the interaction effects were less consistent. For example, as previously discussed, for males, self-control at the age of 11 was found to be a protective factor; however, at age 11, it had the opposite effect. When examining age 11 corporal punishment as a risk factor, the results show that both self-control and having a positive teacher-child relationship were found to be interactive protective factors between age 11 corporal punishment and age 15 aggression. This suggests that at age 11, there is more evidence of protective effects of either self-control or a positive teacher-child relationship in the expected direction. However, these interactions are not consistent; one was protective for males and the other for females. Additionally, the results were quite different when examining self-control and positive teacher-child relationships as moderators between age 11 corporal punishment and

aggression at age 13 and age 15. Interaction effects were also quite different for age 15 corporal punishment as no interactive protective factors were identified. Instead, in these cases, it was found that the moderators exacerbated the effects of corporal punishment on aggression. Regardless, overall, these results support the initial hypothesis at age 11, that self-control and having a positive teacher-child relationship act as interactive protective factors between corporal punishment and aggression.

It is also important to consider the protective effect of variables in relation to the degree of risk that a young person is exposed to (Fontaine et al., 2016). In the current thesis, the protective effect of self-control and positive teacher-child relationships differed depending on the degree of corporal punishment being experienced. For example, as discussed, results show that age 13 self-control had a significant interaction between age 11 corporal punishment and age 15 aggression for females. Furthermore, it appears that the level of corporal punishment experienced by an 11-year-old female with high self-control at age 13 had almost no effect on increased levels of aggression. They do not appear to be affected by exposure to corporal punishment at age 11 as their levels of aggression at age 15 remain the same. However, females who were exposed to lower levels of corporal punishment at age 11, who had high levels of self-control at age 13, had less aggression at age 15 when compared to those exposed to the same amount of corporal punishment but had lower self-control. These results are quite interesting when examining females who have been exposed to high levels of corporal punishment. For females who have been exposed to higher levels of corporal punishment at age 11, having low self-control at age 13 actually resulted in having lower levels of aggression at age 15 when compared to those with higher levels of self-control. That is to say, if you are exposed to a lot of corporal punishment, as an 11-year-old female, then your aggressive behaviour goes down if you lack self-control. Although this finding contradicts previous research, which suggests that low self-control results in higher levels of aggression (Gottfredson & Hirschi, 1990), it could be supported by research which has examined specific gender differences (Evans et al., 2012) when exposed to risk factors such as corporal punishment. As previously mentioned, this finding could be related to females displaying depressive symptoms instead of aggressive behaviours after experiencing corporal punishment. One possible hypothesis could be that if a female is low in self-control (i.e. executive functioning, impulse control) then they do not become more aggressive. They might become less aggressive and more withdrawn when they experience corporal punishment at the age of 11. It might be the case that for this group of females, outcome behaviours such as self-cutting, substance use or suicidal ideations would increase rather than aggression. This relates back to

the previous discussion that not everyone who experiences corporal punishment displays increased aggression. Future research should consider various outcome measures, including depression, when examining gender differences and the effects of corporal punishment.

When examining age 15 corporal punishment, the only significant interaction effects that were found for both self-control and teacher-child relationships were for males. Furthermore, results show that both moderators exacerbated the effects of corporal punishment instead of protecting against them. However, when examining these interaction effects, results show that the protective effects differ depending on the level of exposure to corporal punishment. For example, for males, age 15 self-control showed a significant interaction effect between age 15 corporal punishment and age 15 aggression; however, the direction of the interaction does not suggest this to be a protective factor. The results show that for those who were exposed to less corporal punishment, self-control did act as a protective factor. That is to say, for age 15 males who experienced less corporal punishment, those with higher levels of self-control had lower levels of aggression. However, when exposure to corporal punishment increased, the protective effect of corporal punishment reduced and most of these males ended up with the same level of aggression, regardless of their levels of self-control. This suggests that for age 15 males, if you come from a house with high corporal punishment, your level of self-control does not protect you from developing aggression.

In addition to the degree of risk experienced by a young person, the stage of their development can also have an impact on the protective effect of moderators. For example, this study has found that for age 11 males, self-control was an interactive protective factor between corporal punishment and aggression, however at age 15 it was not. One potential explanation for this difference could be related to the fact that experiencing corporal punishment at age 15 is non-normative (Gershoff et al., 2010; Gershoff & Grogan-Kaylor, 2016). At the age of 11, it may be that experiencing corporal punishment is less ‘shocking’ than if someone were to experience it at age 15. Based on this, the findings from this thesis suggest that corporal punishment has a particularly bad effect on a young person if they are older and also if they are well behaved (or display healthy levels of self-control). This, in turn, suggests that if a young person’s parents administer corporal punishment but their behaviour did not give their parents a reason to slap or hit them (because they have high self-control, they are risk averse, and most behaviours that are associated with getting corporal punishment are not there) then self-control no longer acts as a protective factor if you are exposed to higher levels of corporal punishment. The results show that

for those who are exposed to very little corporal punishment, self-control does act as a protective factor and levels of aggression are much lower. However, the results also show that at the age of 15, if a male experiences corporal punishment, this has such a negative effect that levels of self-control no longer have any effect on aggression. Higher exposure to corporal punishment at age 15 make males more aggressive, irrespective of whether or not they have high or low levels of self-control.

With regards to the moderating effects of teacher-child relationships, as discussed, it was found that for males at age 15, a positive teacher child relationship exacerbated the effects of corporal punishment. However, similar to self-control, the moderating effects of a positive teacher-child relationship differed depending on the level of corporal punishment being experienced. For example, if you are in a home environment with high corporal punishment, a positive teacher-child relationship does not really reduce your levels of aggression. The results show that the level of teacher-child relationship is almost undistinguishable amongst those who are exposed to the highest levels of corporal punishment. However, if you are in a relatively protective home environment with low levels of corporal punishment, having a positive teacher-child relationship effectively reduces your levels of aggression. This would suggest that a positive and supportive teacher-child relationship matters more if your home environment does not include corporal punishment than it does to further support a young person coming from a home environment with higher levels of corporal punishment. If you come from a home environment with high levels of corporal punishment, then a positive teacher-child relationship does not necessarily help. However, in this case, it is still important to consider the main effects discussed above. The main effect between a positive teacher-child relationship and age 15 aggression shows that, irrespective of whether you are high or low in corporal punishment, having a positive teacher-child relationship is an effective direct protective factor and worth promoting.

Final Conclusions

As discussed above, the link between corporal punishment and subsequent aggression has been examined extensively in previous studies. However, one area that is currently developing is the understanding of why some young people become aggressive while others do not, after having been exposed to corporal punishment. Thus, the key research aim of this study was to examine potential protective factors between corporal punishment and subsequent aggression. Rationale is provided for the study objectives in literature discussed in Chapter 2, which identifies how corporal punishment can lead to increased aggression for some adolescents but not for others.

Examining the link between corporal punishment and subsequent aggression is also an important research endeavour as it can help inform the development of intervention strategies which could minimise the negative outcomes associated with corporal punishment.

Implications for Policy and Practice

This study has important implications for both policy makers and practitioners with regards to addressing issues around the use of corporal punishment and minimizing the effect of corporal punishment on the development of adolescent aggression. The main effects found in this study between corporal punishment and aggression highlight the importance of reducing the occurrence of corporal punishment in general. Parents should be provided with support to help them correct undesirable behaviour while not relying on the use of corporal punishment. Moreover, interventions should be directed towards both parents and children. If parents are provided with help to develop the skills needed to reduce corporal punishment, this could help reduce the development of subsequent aggression. Similarly, if interventions focus on reducing the child's levels of aggression this could potentially reduce the chances that a parent will administer corporal punishment in response to the young person's aggression. Addressing these two elements could have lasting effects which could ultimately diminish the coercive parent-child cycle.

There are various parenting programmes that are directed at preventing or reducing aggressive behavioural problems within young people. For example, parents are encouraged to enhance the process of socialisation as a means to develop prosocial behaviour (Eisenberg et al., 2015). Using inductive reasoning instead of corporal punishment is one example of how this can be accomplished (Altschul et al., 2016). Various parenting programmes often focus on teaching parents how to use non-violent discipline strategies (Krahé, 2001). Programmes such as parent management training are aimed at teaching parents how to interact with their children in a way that reinforces prosocial behaviour. Ways to enforce prosocial behaviour include providing positive reinforcement for appropriate behaviour, delivering mild forms of punishment and being able to negotiate compromise (Kazdin, 1987). Parent management training was found to be successful in changing children's antisocial behaviour patterns and improvements were shown to remain stable over long periods after the end of treatment (Kazdin, 1987).

It is also the case that aggression can be reduced through observational learning (Bandura, 1977). If a young person is exposed to a non-violent role model, such as a teacher or other positive adults outside of the family, the young person may develop a new behavioural repertoire.

This could result in aggressive response patterns being replaced with more prosocial ways of reacting to conflict. Observing non-aggressive role models has been shown to decrease aggressive acts from the observer (Baron & Richardson, 1994). This relates to the discussion of social information processing included in Chapter 2. According to Huesmann (2018), when young people are exposed to negative role models and observe aggressive responses to social conflict, they develop behavioural repertoires that are more in favour of aggressive reactions. Thus, one way to reduce aggression in young people is to ensure they develop non-aggressive behavioural repertoires through observing positive role models.

Furthermore, based on the results from the current study, promoting interventions that seek to improve levels of adolescent self-control and positive teacher-child relationships are recommended. Self-control and having a positive teacher-child relationship were found to reduce levels of adolescent aggression across all age groups. Therefore, regardless of whether or not a young person has been exposed to corporal punishment, the direct protective effects of self-control and having a positive teacher-child relationship suggests these should be considered for future intervention programmes. More specifically, both self-control and having a positive teacher-child relationship had the strongest direct protective effect at age 11. Therefore, results from this study would suggest that interventions seek to address levels of self-control and promote positive teacher-child relationships at this age as a priority.

As discussed, self-control was found to be an interactive protective factor between corporal punishment and aggression for age 11 males and having a positive teacher-child relationship was found to be an interactive protective factor for age 11 females. This suggests that interventions which aim to protect against levels of aggression amongst those exposed to corporal punishment should specifically focus on increasing levels of self-control for age 11 males and enhancing teacher-child relationships for age 11 females. The results of the interaction effects highlight the importance of considering different protective effects across adolescent developmental stages as well as between males and females. Furthermore, the results from this thesis also highlight the importance of considering the degree of risk exposed to adolescents when investigating protective factors and interaction effects.

The results from this thesis also provide recommendations for policy makers where corporal punishment has not yet been banned. Based on the results from this thesis, corporal punishment at age 15 should be made illegal globally as it was found to have an enhanced detrimental effect.

At age 15, it was found that corporal punishment had a particularly bad effect on a young person, especially if they demonstrated higher levels of self-control. High exposure to corporal punishment for age 15 males had such a negative effect that levels of self-control were no longer protective against aggression and these males were more aggressive, irrespective of whether or not they had high or low levels of self-control. This was also the case with regards to teacher-child relationships.

Strengths and Limitations

First, it is important to consider some of the limitations of the current study. Capturing the extent of corporal punishment is often difficult due to it going either unreported or unrecognised by both parents and children (Fréchette, Zoratti, & Romano, 2015; Straus & Stewart, 1999; Straus, 2010). Furthermore, children who experience corporal punishment by a family member may not disclose their experiences to others because they do not want to appear to be a troublemaker or a liar (Krahé, 2001). Self-reported experiences of corporal punishment could be influenced by limits of recall accuracy as well as the fact that it is a controversial form of discipline which is sometimes believed to be an appropriate punishment (Fréchette et al., 2015). In Zurich, where data for the current study was collected, corporal punishment is lawful in the home under the parents 'right of correction'. It can be difficult to confidently differentiate between corporal punishment and physical abuse due to the potential overlap of their definitions.

Further difficulty in capturing corporal punishment and physical abuse individually is attributed to the fact that children who have experienced corporal punishment during childhood were also at an increased risk of having also experienced abuse (Fréchette et al., 2015). It is possible that measures of corporal punishment are also acting as a proxy for physical abuse which is the true causal agent. For example, according to Frechette et al. (2015; p.277), ‘among individuals who indicated having experienced spanking, greater spanking frequency, perceptions of impulsiveness in parental discipline and reports of violence between parents significantly increased the risk of physical abuse’. While the current study is examining 'corporal punishment', it would still be valuable for future studies to investigate the link between physical abuse and aggression, due to the potential overlap between the two forms of discipline. For example, Leeb, Paulozzi, Melanson, Simon, and Arias (2008) constructed a universal definition of child maltreatment which included an act or series of commission by a parent or a caregiver that 'resulted in harm, potential for harm, or threat of harm to a child'. Specifically, an act of commission

is deliberate and intentional; however, causing harm to the child may or may not be what was intended.

With regards to the measure of self-control, a possible explanation for the lack of interactive protective effects is that the measure of self-control used in this study focused on low self-control descriptors, rather than also including measures of high self-control. Therefore, it is possible that the low self-control measure does not adequately capture high levels of self-control, which may result in difficulty of identifying an interactive protective effect in which high self-control attenuates the relation between corporal punishment and aggression. In general, studies should aim to use measures that have been shown to reliably measure a wide range of trait levels, to maximise statistical power and to ensure that both ordinal and disordinal interactions can be detected (e.g., Widaman et al., 2012). This applies particularly to studies of risk or resilience where there is often a lack of clarity on whether a particular variable acts in a unipolar manner or bipolar manner; that is, whether a candidate moderator is both an indirect risk *and* protective factor (at its respective poles) or whether it is solely a risk *or* protective factor (at one pole).

There are many strengths of the current study. First, the current study includes the use of longitudinal data which allows for the consideration of temporal order of predictors and protective factors. Furthermore, the use of longitudinal data allowed me to measure exposure of corporal punishment and adolescent aggression concurrently, which helps to establish causal effects. There has also been a lack of research that examines teacher-child relationships within adolescence, as most of the previous research is focused on early childhood (De Laet et al., 2014). A strength of the current research is that main effects and interactions of teacher-child relationships are focused on adolescence which contributes to this gap in the literature. The use of the autoregressive cross-lagged panel model to test for interactions is a further strength of this study. This allowed the analyses to account for previous levels of aggression. Autoregressive cross-lagged panel models have been found to result in smaller main effects. This is because autoregressive cross-lagged panel models account for previous levels of the outcome variable (i.e. aggression) which can lead to a dramatic reduction in the association between the predictor and the outcome. As discussed in Chapter 5, the disadvantage is that by controlling for stability effects, a large portion of the variance in the outcome variable is removed. However, studies have found that although smaller main effects might be found using this statistical approach, those results are still meaningful and worth further interpretation. The strength of the autoregressive

cross-lagged panel model is that it allowed me to ensure that any cross-lagged effects did not simply reflect the association between those two variables at the previous time point.

The results of this thesis raise important implications for aggression prevention programmes. It is recommended that the protective effect of direct and interactive protective factors should continue to be considered differently depending on the adolescent's stage of development, level of exposure to risk and gender. Furthermore, this thesis recommends that interventions focus on strengthening both self-control and positive teacher-child relationships for all ages, as direct protective effects were found with regards to reduced aggression. More specifically, programmes should aim to strengthen levels of self-control for males at age 11 as this was identified to be an interactive protective factor. Additionally, results from this thesis recommend that future programmes aim to strengthen both self-control and teacher-child relationships specifically for males at age 15, especially if they have been exposed to low levels of corporal punishment. With regards to females, programmes should aim to foster strong relationships with teachers at all ages, but specifically with age 11 females as this was found to be a significant interactive protective factor for those exposed to higher levels of corporal punishment. It is also recommended that future research continues to examine gender differences with regards to exposure to corporal punishment and examine interactive protective factors using various outcome measures, as aggression may not be the only outcome associated with exposure to corporal punishment. Finally, this thesis found evidence that supports an intergenerational transmission of corporal punishment, as well as direct effects of experiencing corporal punishment and increased subsequent adolescent aggression. Thus, a final recommendation is that policy and law makers continue to review empirical research which highlights the damaging effects of corporal punishment on adolescent development and support the notion to prohibit all corporal punishment within their jurisdiction.

References

Adachi, P., & Willoughby, T. (2015). Interpreting effect sizes when controlling for stability effects in longitudinal autoregressive models: Implications for psychological science. *European Journal of Developmental Psychology*, *12*(1), 116–128. https://doi.org/10.1080/17405629.2014.963549

Afifi, T. O., & MacMillan, H. L. (2011). Resilience following child maltreatment: A review of protective factors. *Canadian Journal of Psychiatry*, *56*(5), 266–272. https://doi.org/10.1177/070674371105600505

Agnew, R. (1985). A Revised Strain Theory of Delinquency. *Social Forces*, *64*(1), 151–167. Retrieved from http://www.jstor.org/stable/2578977

Agnew, R. (1992). Foundation for a general strain theory of crime and delinquency. *Criminology*, *30*(1), 47-88.

Akhtar, N., & Bradley, E. J. (1991). Social information processing deficits of aggressive children: Present findings and implications for social skills training. *Clinical Psychology Review*, *11*(5), 621–644. https://doi.org/10.1016/0272-7358(91)90007-H

Al-Modallal, H., Peden, A., & Anderson, D. (2008). Impact of physical abuse on adulthood depressive symptoms among women. *Issues in Mental Health Nursing*, *29*(3), 299–314. https://doi.org/10.1080/01612840701869791

Aldao, A., Nolen-Hoeksema, S., & Schweizer, S. (2010). Emotion-regulation strategies across psychopathology: A meta-analytic review. *Clinical Psychology Review*, *30*(2), 217–237. https://doi.org/10.1016/j.cpr.2009.11.004

Allen, J. J., Anderson, C. A., & Bushman, B. J. (2018). The General Aggression Model. *Current Opinion in Psychology*, *19, 75-80.* https://doi.org/10.1016/j.copsyc.2017.03.034

Altschul, I., Lee, S. J., & Gershoff, E. T. (2016). Hugs, not hits: warmth and spanking as predictors of child social competence. *Journal of Marriage and Family*, *78*(3), 695–714. https://doi.org/10.1111/jomf.12306

Andershed, A. K., Gibson, C. L., & Andershed, H. (2016). The role of cumulative risk and protection for violent offending. *Journal of Criminal Justice*, *45*, 78–84. https://doi.org/10.1016/j.jcrimjus.2016.02.006

Archer, J. (2004). Sex differences in aggression in real-world settings: a meta-analytic review. *Review of General Psychology*, *8*(4), 291–322. https://doi.org/10.1037/1089-2680.8.4.291

Averdijk, M., Zirk-Sadowski, J., Ribeaud, D., & Eisner, M. (2016). Long-term effects of two childhood psychosocial interventions on adolescent delinquency, substance use, and antisocial behavior: a cluster randomized controlled trial. *Journal of Experimental Criminology*, *12*(1), 21–47. https://doi.org/10.1007/s11292-015-9249-4

Bailey, J. A., Hill, K. G., Oesterle, S., & Hawkins, J. D. (2009). Parenting practices and problem behavior across three generations: Monitoring, harsh discipline, and drug use in the intergenerational transmission of externalizing behavior. *Developmental Psychology*, *45*(5), 1214–1226. https://doi.org/10.1037/a0016129

Bakermans-Kranenburg, M. J., & van IJzendoorn, M. H. (2006). Gene- environment interaction of the dopamine D4 receptor (DRD4) and observed maternal insensitivity predicting externalizing behavior in preschoolers. *Developmental Psychobiology*, *48*(5), 406–9. https://doi.org/10.1002/dev

Bandura, A. (1977). Social Learning Theory. *Prentice-Hall Series in Social Learning Theory*, *viii*(November 2017), 1–46. https://doi.org/10.1111/j.1460-2466.1978.tb01621.x

Bandura, A. (1978). Social Learning Theory of Aggression. *Journal of Communication*, *28*(3), 12–29. https://doi.org/10.1111/j.1460-2466.1978.tb01621.x

Bandura, A., & Walters, R. H. (1959). *Adolescent Aggression: A Study of the Influence of Child-Training Practices and Family Interrelations. American Sociological Review* (Vol. 25). New York, NY: Ronald Press. https://doi.org/10.2307/2092109

Barnes, J. C., Boutwell, B. B., Beaver, K. M., & Gibson, C. L. (2013). Analyzing the origins of childhood externalizing behavioral problems. *Developmental Psychology*, *49*(12), 2272–2284. https://doi.org/10.1037/a0032061

Baron, R. A., & Richardson, D. R. (1994). Human Aggression. *Aggressive Behaviour, 20*, 461–460.

Bartlett, J. D., Kotake, C., Fauth, R., & Easterbrooks, M. A. (2017). Intergenerational transmission of child abuse and neglect: Do maltreatment type, perpetrator, and substantiation status matter? *Child Abuse and Neglect, 63,* 84-94. https://doi.org/10.1016/j.chiabu.2016.11.021

Benson, M., & Buehler, C. (2012). Family Process and Peer Deviance Influences on Adolescent Aggression: Longitudinal Effects Across Early and Middle Adolescence. *Child Development*, 83(4), 1213-1228

Bentler, P. (1990). Comparative fit indices in structural models. *Psychological Bulletin*, *107*(2), 238–246. https://doi.org/res

Berlin, L., Malone, P., Ayoub, C., Ispa, J., & Fine, M. (2009). Correlates and consequences of spanking and verbal punishment for low-income white, African American and Mexican American toddlers. *Child Development*, *80*(1403–1420). https://doi.org/10.1111/j.1467-8624.2009.01341.x.Correlates

Birch, S. H., & Ladd, G. W. (1997). The teacher-child relationship and children's early school adjustment. *Journal of School Psychology*, *35*(1), 61–79. https://doi.org/10.1016/S0022-4405(96)00029-5

Blankemeyer, M., Flannery, D. J., & Vazsonyi, A. T. (2002). The role of aggression and social competence in children's perceptions of the child-teacher relationship. *Psychology in the Schools*, *39*(3), 293–304. https://doi.org/10.1002/pits.10008

Bradley, R. H., & Corwyn, R. F. (2007). Externalizing problems in fifth grade: Relations with productive activity, maternal sensitivity, and harsh parenting from infancy through middle childhood. *Developmental Psychology*, *43*(6), 1390–1401. https://doi.org/10.1037/0012-1649.43.6.1390

Burnette, M. L., Oshri, A., Lax, R., Richards, D., & Ragbeer, S. N. (2012). Pathways from harsh parenting to adolescent antisocial behavior: A multidomain test of gender moderation. *Development and Psychopathology*, *24*(3), 857–870. https://doi.org/10.1017/S0954579412000417

Calvete, E., & Orue, I. (2012). The role of emotion regulation in the predictive association between social information processing and aggressive behavior in adolescents. *International Journal of Behavioral Development*, *36*(5), 338–347. https://doi.org/10.1177/0165025412444079

Caspi, A., McCray, J., Moffitt, T. E., Mill, J., Martin, J., Craig, I. W., … Poulton, R. (2002). Role

of genotype in the cycle of violence in maltreated children. *Science*, *297*(5582), 851–854. https://doi.org/10.1126/science.1072290

Chang, H., Olson, S. L., Sameroff, A. J., & Sexton, H. R. (2011). Child effortful control as a mediator of parenting practices on externalizing behavior: Evidence for a sex-differentiated pathway across the transition from preschool to school. *Journal of Abnormal Child Psychology*, *39*(1), 71–81. https://doi.org/10.1007/s10802-010-9437-7

Childs, A. W., Fite, P. J., Moore, T. M., Lochman, J. E., & Pardini, D. A. (2014). Bidirectional associations between parenting behavior and child callous-unemotional traits: Does parental depression moderate this link? *Journal of Abnormal Child Psychology*, *42*(7), 1141–1151. https://doi.org/10.1007/s10802-014-9856-y

Cohen, J. (1992). Quantitative methods in psychology: A power primer. *Psychological Bulletin*, *112*(1), 155–159. https://doi.org/10.1038/141613a0

Coie, J. D., Cillessen, A. H., Dodge, K. A., Hubbard, J. A., Schwartz, D., Lemerise, E. A., & Bateman, H. (1999). It takes two to fight: A test of relational factors and a method for assessing aggressive dyads. *Developmental Psychology*, *35*(5), 1179–1188. https://doi.org/10.1037/0012-1649.35.5.1179

Coie, J. D., & Dodge, K. A. (1988). Multiple sources of data on social behavior and social status in the school: A cross-age comparison. *Child Development*, *59*(3), 815–829.

Collins, W. A., Maccoby, E. E., Steinberg, L., Hetherington, E. M., & Bornstein, M. H. (2000). Contemporary research on parenting: The case for nature and nurture. *American Psychologist*, *55*(2), 218–232. https://doi.org/10.1037/0003-066X.55.2.218

Cope, K. C. (2010). The age of discipline: The relevance of age to the reasonableness of corporal punishment. *Law and Contemporary Problems*, *73*(2), 167–188.

Côté, S., Vaillancourt, T., LeBlanc, J. C., Nagin, D. S., & Tremblay, R. E. (2006). The development of physical aggression from toddlerhood to pre-adolescence: A nation wide longitudinal study of Canadian children. *Journal of Abnormal Child Psychology*, *34*(1), 71–85. https://doi.org/10.1007/s10802-005-9001-z

Crick, N. R., & Dodge, K. A. (1994). A Review and reformulation of social information-processing mechanisms in children's social adjustment. *Psychological Bulletin*, *115*(1), 74–101. https://doi.org/10.1037/0033-2909.115.1.74

Crick, N. R., & Dodge, K. A. (1996). Social Information-processing mechanisms in reactive and proactive aggression. *Child Development*, *67*(3), 993–1002.

Cruise, K. R., Jacobs, J. E., & Lyons, P. M. (1994). Definitions of physical abuse: A preliminary inquiry into children's perceptions. *Behavioral Sciences & the Law*, *12*(1), 35–48. https://doi.org/10.1002/bsl.2370120105

Cyr, M., Pasalich, D. S., McMahon, R. J., & Spieker, S. J. (2014). The longitudinal link between parenting and child aggression: The moderating effect of attachment security. *Child Psychiatry and Human Development*, *45*(5), 555–564. https://doi.org/10.1007/s10578-013-0424-4

Dallaire, D. H., & Weinraub, M. (2007). Infant–mother attachment security and children's anxiety and aggression at first grade. *Journal of Applied Developmental Psychology*, *28*(5–6), 477–492. https://doi.org/10.1016/j.appdev.2007.06.005

Davis, K. S., & Dupper, D. R. (2004). Student-Teacher Relationships. *Journal of Human Behavior in the Social Environment*, *9*(1–2), 179–193.

https://doi.org/10.1300/J137v09n01_12

de Kemp, R. A., Vermulst, A. A., Finkenauer, C., Scholte, R. H., Overbeek, G., Rommes, E. W., & Engels, R. C. (2009). Self-Control and early adolescent antisocial behavior: A longitudinal analysis. *The Journal of Early Adolescence, 29(4),* 497-517 https://doi.org/10.1177/0272431608324474

De Laet, S., Colpin, H., Goossens, L., Van Leeuwen, K., & Verschueren, K. (2014). Comparing parent-child and teacher-child relationships in early adolescence: Measurement invariance of perceived attachment-related dimensions. *Journal of Psychoeducational Assessment*, *32*(6), 521–532. https://doi.org/10.1177/0734282914527408

Deater-Deckard, K., & Dodge, K. A. (1997). Externalizing Behavior problems and discipline revisited: Nonlinear Effects and variation by culture, context, and gender. *Psychological Inquiry*, *8*(3), 161–175. https://doi.org/10.1207/s15327965pli0803_1

Dodge, K. A., Malone, P. S., Greenberg, M. T., Problems, C., Dodge, A., Greenberg, T., & Su, G. (2015). Testing an idealized dynamic cascade model of the development of serious violence in adolescence. *Child Development*, *79*(6), 1907–1927.

Dodge, K. A., Pettit, G. S., & Bates, J. E. (1994). Socialization mediators of the relation between socioeconomic status and child conduct problems. *Child Development.Special Issue: Children and Poverty*, *65*(2), 649. https://doi.org/10.2307/1131407

Doumen, S., Verschueren, K., Buyse, E., Germeijs, V., Luyckx, K., & Soenens, B. (2008). Reciprocal relations between teacher-child conflict and aggressive behavior in kindergarten: A three-wave longitudinal study. *Journal of Clinical Child and Adolescent Psychology*, *37*(3), 588–599. https://doi.org/10.1080/15374410802148079

Dubow, E. F., Huesmann, L. R., Boxer, P., & Smith, C. (2016). Childhood and adolescent risk and protective factors for violence in adulthood. *Journal of Criminal Justice*, *45*, 26–31. https://doi.org/10.1016/j.jcrimjus.2016.02.005

Eiden, R. D., Edwards, E. P., & Leonard, K. E. (2007). A conceptual model for the development of externalizing behavior problems among kindergarten children of alcoholic families: Role of parenting and children's self-regulation. *Developmental Psychology*, *43*(5), 1187–1201. https://doi.org/10.1037/0012-1649.43.5.1187

Eisenberg, N., Cumberland, A., Spinrad, T. L., Fabes, R. A., Shepard, S. A., Reiser, M., … Guthrie, I. K. (2001). The relations of regulation and emotionality to children's externalizing and internalizing problem behavior. *Child Development*, *72*(4), 1112–1134. https://doi.org/10.1111/1467-8624.00337

Eisenberg, N., Spinrad, T. L., & Knafo-Noam, A. (2015). Prosocial Development. In *Handbook of Child Psychology and Developmental Science* (pp. 1–47). Hoboken, NJ, USA: Wiley. https://doi.org/10.1002/9781118963418.childpsy315

Eisner, M., Ribeaud, D., Jünger, R., & Meidert, U. (2008). *Fruehpraevention von Gewalt und aggression*. Rüegger.

Eisner, M., & Malti, T. (2015). Aggressive and Violent Behavior. In *Handbook of Child Psychology and Developmental Science* (pp. 1–48). Hoboken, NJ, USA: John Wiley & Sons, Inc. https://doi.org/10.1002/9781118963418.childpsy319

Eisner, M., & Ribeaud, D. (2007). Conducting a criminological survey in a culturally diverse context: lessons from the zurich project on the social development of children. *European Journal of Criminology*, *4*(3), 271–298. https://doi.org/10.1177/1477370807077183

Eisner, N., Murray, A., Ribeaud, D., Eisner, M. (2018). An Analysis of Non-response and Attrition in the Zurich Project on Social Development from Childhood to Adulthood (z-proso). *International Journal of Behavioural Development*. In Press.

Elder, G. H. J., Caspi, A., & van Nguyen, T. (1986). Resourceful and vulnerable children: Family influences in hard times. In *Development as action in context* (pp. 167–186). Berlin, Heidelberg: Springer Berlin Heidelberg. https://doi.org/10.1007/978-3-662-02475-1_9

Elias, P., & Birch, M. (1994). Establishment of Community-Wide Occupational Statistics: ISCO 88 (COM), A Guide for Users. *Institute for Employment Research*, *88*(February), 35.

Ellison, C. G., & Sherkat, D. E. (1993). Conservative protestantism and support for corporal punishment. *American Sociological Review*, *58*(1), 131. https://doi.org/10.2307/2096222

Erath, S. A., El-Sheikh, M., Hinnant, J. B., & Cummings, E. M. (2011). Skin conductance level reactivity moderates the association between harsh parenting and growth in child externalizing behavior. *Developmental Psychology*, *47*(3), 693–706. https://doi.org/10.1037/a0021909

Erdley, C. A., & Asher, S. R. (1998). Linkages between aggression and children's legitimacy of aggression beliefs. *Social Development*, *7*(3). https://doi.org/10.1111/1467-9507.00070

Evans, S. Z., Simons, L. G., & Simons, R. L. (2012). The effect of corporal punishment and verbal abuse on delinquency: Mediating mechanisms. *Journal of Youth and Adolescence*, *41*(8), 1095–1110. https://doi.org/10.1007/s10964-012-9755-x

Farrington, D. P. (1994). Interactions between individual and contextual factors in the development of offending. In *Adolescence in context: The interplay of family, school, peers and work in adjustment* (pp. 336–389).

Farrington, D. P., Coid, J. W., Harnett, L. M., Jolliffe, D., Soteriou, N., Turner, R. E., & West, D. J. (2006). *Criminal careers up to age 50 and life success up to age 48: New findings from the cambridge study in delinquent development*. *Home Office Research Study,* 299*.*

Farrington, D. P., & Ttofi, M. M. (2011). Protective and promotive factors in the development of offending. in *antisocial behaviour and crime: Contributions of developmental and evaluation research to prevention and intervention* (pp. 71–88).

Farrington, D. P., Ttofi, M. M., & Piquero, A. R. (2016). Risk, promotive, and protective factors in youth offending: Results from the Cambridge study in delinquent development. *Journal of Criminal Justice*, *45*, 63–70. https://doi.org/10.1016/j.jcrimjus.2016.02.014

Fergusson, D. M., & Lynskey, M. T. (1997). Physical punishment / maltreatment during childhood and adjustment in young adulthood. *Child Abuse & Neglect*, *21*(7), 617–30. https://doi.org/10.1016/S0145-2134(97)00021-5

Fitzpatrick, C. (2011). What is the difference between "desistance" and "resilience"? Exploring the relationship between two key concepts. *Youth Justice*, *11*(3), 221–234. https://doi.org/10.1177/1473225411420528

Fontaine, N. M. G., Brendgen, M., Vitaro, F., & Tremblay, R. E. (2016). Compensatory and protective factors against violent delinquency in late adolescence: Results from the Montreal longitudinal and experimental study. *Journal of Criminal Justice*, *45*, 54–62. https://doi.org/10.1016/j.jcrimjus.2016.02.013

Fréchette, S., Zoratti, M., & Romano, E. (2015). What is the link between corporal punishment and child physical abuse? *Journal of Family Violence*, *30*(2), 135–148.

https://doi.org/10.1007/s10896-014-9663-9

Gagné, M.-H. H., Tourigny, M., Joly, J., & Pouliot-Lapointe, J. (2007). Predictors of adult attitudes toward corporal punishment of children. *Journal of Interpersonal Violence*, *22*(10), 1285–1304. https://doi.org/10.1177/0886260507304550

Ganzeboom, H. B. G., Graaf, P. M. D. E., & Treiman, D. J. (1992). A standard international socio-economic occupational status. *Social Science Research*, *21*, 1–56. https://doi.org/10.1006/ssre.1996.0010

Garthe, R. C., Sullivan, T. N., & Larsen, R. A. (2015). Bidirectional associations between perceived parental support for violent and nonviolent responses and early adolescent aggressive and effective nonviolent behaviors. *Journal of Adolescence*, *45*(2015), 183–195. https://doi.org/10.1016/j.adolescence.2015.09.009

Gershoff, E. T. (2002). Corporal punishment by parent and associated behavior and experiences: A meta-analytic and theoretical review. *Psychological Bulletin*, *128*, 539–579. https://doi.org/10.1037//0033-2909.128.4.539

Gershoff, E. T. (2013). Spanking and child development: We know enough now to stop hitting our children. *Child Development Perspectives, 7(3),*133-137. https://doi.org/10.1111/cdep.12038

Gershoff, E. T., & Grogan-Kaylor, A. (2016). Spanking and child outcomes: Old controversies and new meta-analyses. *Journal of Family Psychology, 30(4),* 453. https://doi.org/10.1037/fam0000191

Gershoff, E. T., Grogan-Kaylor, A., Lansford, J. E., Chang, L., Zelli, A., Deater-Deckard, K., & Dodge, K. A. (2010). Parent discipline practices in an international sample: Associations with child behaviors and moderation by perceived normativeness. *Child Development*, *81*(2), 487–502.

Gottfredson, M., & Hirschi, T. (1990). *A General Theory of Crime*. Stanford University Press.

Granic, I., & Patterson, G. R. (2003). Toward a comprehensive model of antisocial development: A dynamic systems approach. *Psychological Review, 113(1),* 101.

Grasmick, H. G., Tittle, C. R., Bursik, R. J., & Arneklev, B. J. (1993). Testing the core empirical implications of gottfredson and hirschi's general theory of crime. *Journal of Research in Crime and Delinquency*, *30*(1), 5–29. https://doi.org/10.1177/0022427893030001002

Greenwald, R. (2002). The role of trauma in conduct disorder. *Journal of Aggression, Maltreatment & Trauma*, *6*(1), 5–23. https://doi.org/10.1300/J146v06n01_02

Grogan-Kaylor, A., & Otis, M. D. (2007). The Predictors of parental use of corporal punishment. *Family Relations*, *56*(1), 80–91.

Gross, J. J. (2007). *Handbook of emotional regulation*. London: Guilford Press.

Gunnoe, M. L., & Mariner, C. L. (1997). Toward a developmental-contextual model of the effects of parental spanking on children's aggression. *Archives of Pediatrics & Adolescent Medicine*, *151*(8), 768. https://doi.org/10.1001/archpedi.1997.02170450018003

Hale, W. W., Van Der Valk, I., Engels, R., & Meeus, W. (2005). Does perceived parental rejection make adolescents sad and mad? The association of perceived parental rejection with adolescent depression and aggression. *Journal of Adolescent Health*, *36*(6), 466–474. https://doi.org/10.1016/j.jadohealth.2004.04.007

Hall, J. E., Simon, T. R., Lee, R. D., & Mercy, J. A. (2012). Implications of direct protective

factors for public health research and prevention strategies to reduce youth violence. *American Journal of Preventive Medicine, 43(2),* S76-S83. https://doi.org/10.1016/j.amepre.2012.04.019

Hall, J. E., Simon, T. R., Mercy, J. A., Loeber, R., Farrington, D. P., & Lee, R. D. (2012). Centers for disease control and prevention's expert panel on protective factors for youth violence perpetration: Background and overview. *American Journal of Preventive Medicine, 43(2),* S1-S7. https://doi.org/10.1016/j.amepre.2012.04.026

Hamaker, E. L., Kuiper, R. M., & Grasman, R. P. (2015). A critique of the cross-lagged panel model. *Psychological Methods*, *20*(1), 102–116. https://doi.org/10.1037/a0038889

Harper, F. W., Brown, A. M., Arias, I., & Brody, G. (2006). Corporal punishment and kids: How do parent support and gender influence child adjustment? *Journal of Family Violence*, *21*(3), 197–207. https://doi.org/10.1007/s10896-006-9018-2

Hawkins, J. D., Catalano, R. F., & Arthur, M. W. (2002). Promoting science-based prevention in communities. *Addictive Behaviors, 27(6),* 951–976. https://doi.org/10.1016/S0306-4603(02)00298-8

Hemphill, S. A., Heerde, J. A., & Scholes-Balog, K. E. (2016). Risk factors and risk-based protective factors for violent offending: A study of young Victorians. *Journal of Criminal Justice*, *45*, 94–100. https://doi.org/10.1016/j.jcrimjus.2016.02.012

H Herrenkohl, T. I., Hill, K. G., Chung, I. J., Guo, J., Abbott, R. D., & Hawkins, J. D. (2003). Protective factors against serious violent behavior in adolescence: A prospective study of aggressive children. Social Work Research, 27(3), 179-191

Herrenkohl, T. I., Huang, B., Tajima, E. A., & Whitney, S. D. (2003). Examining the link between child abuse and youth violence: An analysis of mediating mechanisms. *Journal of Interpersonal Violence*, *18*(10), 1189–1208. https://doi.org/10.1177/0886260503255558

Herrenkohl, T. I., Maguin, E., Hill, K. G., Hawkins, J. D., Abbott, R. D., & Catalano, R. F. (2000). Developmental risk factors for youth violence. *Journal of Adolescent Health*, *26*(3), 176–186. https://doi.org/10.1016/S1054-139X(99)00065-8

Hipwell, A., Keenan, K., Kasza, K., Loeber, R., Stouthamer-Loeber, M., & Bean, T. (2008). Reciprocal influences between girls' conduct problems and depression, and parental punishment and warmth: A six year prospective analysis. *Journal of Abnormal Child Psychology*, *36*(5), 663–677. https://doi.org/10.1007/s10802-007-9206-4

Holmes, M., Yoon, S., Voith, L., Kobulsky, J., & Steigerwald, S. (2015). Resilience in physically abused children: Protective factors for aggression. *Behavioral Sciences*, *5*(2), 176–189. https://doi.org/10.3390/bs5020176

Hosser, D., Raddatz, S., & Windzio, M. (2007). Child maltreatment, revictimization, and violent behavior. *Violence and Victims,* 22(3), 318–334.

Howell, K. H., & Miller-Graff, L. E. (2014). Protective factors associated with resilient functioning in young adulthood after childhood exposure to violence. *Child Abuse and Neglect*, *38*(12), 1985–1994. https://doi.org/10.1016/j.chiabu.2014.10.010

Howes, C., Hamilton, C. E., & Matheson, C. C. (1994). Children's relationships with peers: Differential associations with aspects of the teacher-child relationship. *Child Development*, *65*(1), 253–263.

Hubbard, J. A. (2001). Emotion expression processes in children's peer interaction: The role of peer rejection, aggression, and gender. *Child Development*, *72*(5), 1426–1438.

https://doi.org/10.1111/1467-8624.00357

Huesmann, L. R. (2018). An integrative theoretical understanding of aggression. *Current Opinion in Psychology*, *19*, 119–124. https://doi.org/10.4324/9781315524696

Hughes, J. N., Cavell, T. A., & Jackson, T. (1999). Influence of the teacher-student relationship in childhood conduct problems: A prospective study. *Journal of Clinical Child Psychology*, *28*(2), 173–184. https://doi.org/10.1207/s15374424jccp2802_5

Jo, Y., & Bouffard, L. (2014). Stability of self-control and gender. *Journal of Criminal Justice*, *42*(4), 356–365. https://doi.org/10.1016/j.jcrimjus.2014.05.001

Jolliffe, D., Farrington, D. P., Loeber, R., & Pardini, D. (2016). Protective factors for violence: Results from the Pittsburgh Youth Study. *Journal of Criminal Justice*, *45*, 32–40. https://doi.org/10.1016/j.jcrimjus.2016.02.007

Jolliffe, D., Farrington, D. P., Piquero, A. R., Loeber, R., & Hill, K. G. (2017). Systematic review of early risk factors for life-course-persistent, adolescence-limited, and late-onset offenders in prospective longitudinal studies. *Aggression and Violent Behavior, 33,* 15-23. https://doi.org/10.1016/j.avb.2017.01.009

Kassis, W., Artz, S., Scambor, C., Scambor, E., & Moldenhauer, S. (2013). Finding the way out: A non-dichotomous understanding of violence and depression resilience of adolescents who are exposed to family violence. *Child Abuse and Neglect*, *37*(2–3), 181–199. https://doi.org/10.1016/j.chiabu.2012.11.001

Kaufman, J., & Zigler, E. (1987). Do abused children become abusive parents. *American Journal of Orthopsychiatry*, *57*(2), 186–192. https://doi.org/10.1111/j.1939-0025.1987.tb03528.x

Kazdin, A. E. (1987). Treatment of antisocial behavior in children: Current status and future directions. *Psychological Bulletinm 102(2)*, 187. https://doi.org/10.1037/0033-2909.102.2.187

Keatley, D. A., Allom, V., & Mullan, B. (2017). The effects of implicit and explicit self-control on self-reported aggression. *Personality and Individual Differences*, *107*, 154–158. https://doi.org/10.1016/j.paid.2016.11.046

Keijsers, L., Loeber, R., Branje, S., & Meeus, W. (2011). Bidirectional links and concurrent development of parent-child relationships and boys' offending behavior. *Journal of Abnormal Psychology*, *120*(4), 878–889. https://doi.org/10.1037/a0024588

Kim, B. K. E., Gilman, A. B., Hill, K. G., & Hawkins, J. D. (2016). Examining protective factors against violence among high-risk youth: Findings from the Seattle Social Development Project. *Journal of Criminal Justice*, *45*, 19–25. https://doi.org/10.1016/j.jcrimjus.2016.02.015

Knutson, J. F., DeGarmo, D. S., & Reid, J. B. (2004). Social disadvantage and neglectful parenting as precursors to the development of antisocial and aggressive child behavior: Testing a theoretical model. *Aggressive Behavior*, *30*(3), 187–205. https://doi.org/10.1002/ab.20016

Krahé, B. (2001). *The Social Psychology of Aggression*. Hove: Psychology Press.

Lansford, J. E., Cappa, C., Putnick, D. L., Bornstein, M. H., Deater-Deckard, K., & Bradley, R. H. (2017). Change over time in parents' beliefs about and reported use of corporal punishment in eight countries with and without legal bans. *Child Abuse and Neglect*, *71*, 44–55. https://doi.org/10.1016/j.chiabu.2016.10.016

Lansford, J. E., Criss, M. M., Laird, R. D., Shaw, D. S., Pettit, G. S., Bates, J. E., & Dodge, K. A. (2011). Reciprocal relations between parents' physical discipline and children's externalizing behavior during middle childhood and adolescence. *Development and Psychopathology*, *23*(1), 225–238. https://doi.org/10.1017/S0954579410000751

Lansford, J. E., Deater-Deckard, K., Dodge, K. A., Bates, J. E., & Pettit, G. S. (2004). Ethnic differences in the link between physical discipline and later adolescent externalizing behaviors. *Journal of Child Psychology and Psychiatry and Allied Disciplines*, *45*(4), 801–812. https://doi.org/10.1111/j.1469-7610.2004.00273.x

Lansford, J. E., & Dodge, K. a. (2008). Cultural norms for adult corporal punishment of children and societal rates of endorsement and use of violence. *Parenting, Science and Practice*, *8*(3), 257–270. https://doi.org/10.1080/15295190802204843

Lansford, J. E., Miller-Johnson, S., Berlin, L. J., Dodge, K. A., Bates, J. E., & Pettit, G. S. (2007). Early physical abuse and later violent delinquency: A prospective longitudinal study. *Child Maltreatment, 12(3),* 233-245. https://doi.org/10.1177/1077559507301841

Lansford, J. E., Sharma, C., Malone, P. S., Woodlief, D., Dodge, K. A., Oburu, P., … Di Giunta, L. (2014). Corporal punishment, maternal warmth, and child adjustment: A longitudinal study in eight countries. *Journal of Clinical Child & Adolescent Psychology*, *43*(4), 670–685. https://doi.org/10.1080/15374416.2014.893518

Lansford, J. E., Wager, L. B., Bates, J. E., Pettit, G. S., & Dodge, K. A. (2012). Forms of spanking and children's externalizing behaviors. *Family Relations, 61(2),* 224-236. https://doi.org/10.1111/j.1741-3729.2011.00700.x

Lapré, G. E., & Marsee, M. A. (2016). The Role of race in the association between corporal punishment and externalizing problems: Does punishment severity matter? *Journal of Child and Family Studies*, *25*(2), 432–441. https://doi.org/10.1007/s10826-015-0250-3

Larzelere, R. E., & Kuhn, B. R. (2005). Comparing child outcomes of physical punishment and alternative disciplinary tactics: A meta-analysis. *Clinical Child and Family Psychology Review*, *8*(1), 1–37. https://doi.org/10.1007/s10567-005-2340-z

Lee, S. J., Altschul, I., & Gershoff, E. T. (2013). Does warmth moderate longitudinal associations between maternal spanking and child aggression in early childhood? *Developmental Psychology*, *49*(11), 2017–28. https://doi.org/10.1037/a0031630

Lee, S. J., Altschul, I., & Gershoff, E. T. (2015). Wait until your father gets home: Mother's and fathers' spanking and development of child aggression. *Children and Youth Services Review*, *52*, 158–166. https://doi.org/10.1016/j.childyouth.2014.11.006

Leeb, R. T., Paulozzi, L. J., Melanson, C., Simon, T. R., & Arias, I. (2008). Child maltreatment surveillance: Uniform definitions for public health and recommended data elements, version. *Annual Review of Clinical Psychology*, *1*, 409–438. https://doi.org/10.1177/1077559599004001005

Loeber, R., & Farrington, D. P. (2012). Advancing knowledge about direct protective factors that may reduce youth violence. *American Journal of Preventative Medicine, 43(2),* S24-S27. https://doi.org/10.1016/j.amepre.2012.04.031

Loeber, R., & Hay, D. (1997). Key Issues in the development of aggression and violence from childhood to early adulthood. *Annual Review of Psychology*, *48*(1), 371–410. https://doi.org/10.1146/annurev.psych.48.1.371

Loeber, R., Pardini, D. A., Stouthamer-Loeber, M., & Raine, A. (2007). Do cognitive, physiological, and psychosocial risk and promotive factors predict desistance from

delinquency in males? *Development and Psychopathology*, *19*(3), 867–887. https://doi.org/10.1017/S0954579407000429

Loeber, R., & Stouthamer-Loeber, M. (1998). Juvenile aggression at home and at school. *Violence in American Schools: A new Perspective,* 94–126.

Longshore, D., Turner, S., & Stein, J. (1996). Self-control in a criminal sample: an examination of construct validity. *Criminology*, *34*(2), 209. https://doi.org/10.3366/ajicl.2011.0005

Lösel, F., & Bliesener, T. (1994). some high-risk adolescents do not develop conduct problems: A study of protective factors. *International Journal of Behavioral Development*, *17*(4), 753–777. https://doi.org/10.1177/016502549401700411

Lösel, F., Bliesener, T., & Bender, D. (2007). Social information processing, experiences of aggression in social contexts, and aggressive behavior in adolescents. *Criminal Justice and Behavior*, *34*(3), 330–347. https://doi.org/10.1177/0093854806295833

Lösel, F., & Farrington, D. P. (2012). Direct protective and buffering protective factors in the development of youth violence. *American Journal of Preventive Medicine*, *43(2),* S8-S23. https://doi.org/10.1016/j.amepre.2012.04.029

Lytton, H., & Romney, D. M. (1991). Parents' differential socialization of boys and girls: A meta-analysis. *Psychological Bulletin*, *109*(2), 267–296. https://doi.org/10.1037/0033-2909.109.2.267

MacKenzie, M. J., Nicklas, E., Brooks-Gunn, J., & Waldfogel, J. (2015). Spanking and children's externalizing behavior across the first decade of life: Evidence for transactional processes. *Journal of Youth and Adolescence*, *44*(3), 658–669. https://doi.org/10.1007/s10964-014-0114-y

Maldonado-Carreño, C., & Votruba-Drzal, E. (2011). Teacher-child relationships and the development of academic and behavioral skills during elementary school: A within- and between-child analysis. *Child Development*, *82*(2), 601–616. https://doi.org/10.1111/j.1467-8624.2010.01533.x

Malti, T., Ribeaud, D., & Eisner, M. (2011). The effectiveness of two universal preventive interventions in reducing children's externalizing behavior: A cluster randomized controlled trial. *Journal of Clinical Child & Adolescent Psychology*, *40*(5), 677-692.

Marcus, R. F. (2017). *The Development of Aggression and Volence in Adolescence*. Palgrave Macmillan.

McElroy, E. M., & Rodriguez, C. M. (2008). Mothers of children with externalizing behavior problems: Cognitive risk factors for abuse potential and discipline style and practices. *Child Abuse and Neglect*, *32*(8), 774–784. https://doi.org/10.1016/j.chiabu.2008.01.002

Mendez, M., Durtschi, J., Neppl, T. K., & Stith, S. M. (2016). Corporal punishment and externalizing behaviors in toddlers: The moderating role of positive and harsh parenting. *Journal of Family Psychology*, *30*(8), 887–895. https://doi.org/10.1037/fam0000187

Moffitt, T. E. (1993). Adolescence-limited and life-course-persistent antisocial behavior: A developmental taxonomy. *Psychological Review*, *100*(4), 674–701. https://doi.org/10.1037/0033-295X.100.4.674

Moffitt, T. E. (2005). The new look of behavioral genetics in developmental psychopathology: Gene-environment interplay in antisocial behaviors. *Psychological Bulletin*, *131*(4), 533–554. https://doi.org/10.1037/0033-2909.131.4.533

Moffitt, T. E., Caspi, A., Dickson, N., Silva, P., & Stanton, W. (1996). Childhood-onset versus

adolescent-onset antisocial conduct problems in males: Natural history from ages 3 to 18 years. *Development and Psychopathology*, *8*(2), 399. https://doi.org/10.1017/S0954579400007161

Molnar, B. E., Buka, S. L., Brennen, R. T., Holton, J. K., & Earls, F. (2003). A multilevel study of neighborhoods and parent-to-child physical aggression: Results from the Project on Human Development in Chicago Neighborhoods. *Child Maltreatment*, *8*(2), 84–97. https://doi.org/10.1177/1077559502250822

Morris, A. S., Silk, J. S., Steinberg, L., Myers, S. S., & Robinson, L. R. (2007). The role of the family context in the development of emotion regulation. *Social Development*, *16*(2), 361–388. https://doi.org/10.1111/j.1467-9507.2007.00389.x

Morris, S. Z., & Gibson, C. L. (2011). Corporal punishment's influence on children's aggressive and delinquent behavior. *Criminal Justice and Behavior*, *38*(8), 818–839. https://doi.org/10.1177/0093854811406070

Muller, R. T., Hunter, J. E., & Stollak, G. (1995). The intergenerational transmission of corporal punishment: A comparison of social learning and temperament models. *Child Abuse and Neglect*, *19*(11), 1323–1335. https://doi.org/10.1016/0145-2134(95)00103-F

Nas, C. N., Orobio De Castro, B., & Koops, W. (2005). Social Information Processing in delinquent adolescents. *Psychology, Crime and Law*, *11*(4), 363–375. https://doi.org/10.1080/10683160500255307

Niu, H., Liu, L., & Wang, M. (2018). Intergenerational transmission of harsh discipline: The moderating role of parenting stress and parent gender. *Child Abuse & Neglect*, *79*(88), 1–10. https://doi.org/10.1016/j.chiabu.2018.01.017

O'Connor, E. E., Collins, B. A., & Supplee, L. (2012). Behavior problems in late childhood: The roles of early maternal attachment and teacher-child relationship trajectories. *Attachment and Human Development*, *14*(3), 265–288. https://doi.org/10.1080/14616734.2012.672280

Oberle, E., Schonert-Reichl, K. A., Guhn, M., Zumbo, B. D., & Hertzman, C. (2014). The role of supportive adults in promoting positive development in middle childhood: A population-based study. *Canadian Journal of School Psychology*, *29*(4), 296–316. https://doi.org/10.1177/0829573514540116

Obsuth, I., Eisner, M. P., Malti, T., & Ribeaud, D. (2015a). The developmental relation between aggressive behaviour and prosocial behaviour: A 5-year longitudinal study. *BMC Psychology*, *3(1)*, 16. https://doi.org/10.1186/S40359-015-0073-4

Obsuth, I., Murray, A. L., Malti, T., Sulger, P., Ribeaud, D., & Eisner, M. (2017). A non-bipartite propensity score analysis of the effects of teacher–student relationships on adolescent problem and prosocial behavior. *Journal of Youth and Adolescence*, *46*(8), 1661–1687. https://doi.org/10.1007/s10964-016-0534-y

Olson, S. L., Lopez-Duran, N., Lunkenheimer, E. S., Chang, H., & Sameroff, A. J. (2011). Individual differences in the development of early peer aggression: Integrating contributions of self-regulation, theory of mind, and parenting. *Development and Psychopathology*, *23*(1), 253–266. https://doi.org/10.1017/S0954579410000775

Paolucci, E. O., & Violato, C. (2004). A meta-analysis of the published research on the affective, cognitive, and behavioral effects of corporal punishment. *The Journal of Psychology*, *138*(3), 197–221. https://doi.org/10.3200/JRLP.138.3.197-222

Paolucci, E. O., & Violato, C. (2004). A meta-analysis of the published research on the affective, cognitive, and behavioral effects of corporal punishment. *The Journal of Psychology*,

138(3), 197–221. https://doi.org/10.3200/JRLP.138.3.197-222

Pardini, D. A., Fite, P. J., & Burke, J. D. (2008). Bidirectional associations between parenting practices and conduct problems in boys from childhood to adolescence: The moderating effect of age and African-American ethnicity. *Journal of Abnormal Child Psychology*, *36*(5), 647–662. https://doi.org/10.1007/s10802-007-9162-z

Patterson, G. R. (1982). *Coercive family process*. *Children and Youth Services Review* (Vol. 3). Castalia Publishing Company. https://doi.org/10.1016/0190-7409(84)90040-9

Peters, R. D., McMahon, R. J., & Quinsey, V. L. (Eds.). (1992). *Aggression and Violence throughout the Life Span.* Thousand Oaks, CA: Sage.

Pianta, R. C., & Stuhlman, M. W. (2004). Teacher-child relationships and children's success in the first years of school. *School Psychology Review*, *33*(3), 444–458. https://doi.org/10.1037/10314-000

Piquero, A. R., Carriaga, M. L., Diamond, B., Kazemian, L., & Farrington, D. P. (2012). Stability in aggression revisited. *Aggression and Violent Behavior, 17(4),* 365-372. https://doi.org/10.1016/j.avb.2012.04.001

Pouwels, J. L., & Cillessen, A. H. (2013). Correlates and outcomes associated with aggression and victimization among elementary-school children in a low-income urban context. *Journal of Youth and Adolescence, 42(2),* 190-205. https://doi.org/10.1007/s10964-012-9875-3

Ribeaud, D., & Eisner, M. (2010). Risk factors for aggression in pre-adolescence: Risk domains, cumulative risk and gender differences - Results from a prospective longitudinal study in a multi-ethnic urban sample. *European Journal of Criminology*, *7*(6), 460–498. https://doi.org/10.1177/1477370810378116

Rubin, K. H., Burgess, K. B., Dwyer, K. M., & Hastings, P. D. (2003). Predicting preschoolers' externalizing behaviors from toddler temperament, conflict, and maternal negativity. *Developmental Psychology*, *39*(1), 164–176. https://doi.org/10.1037//0012-1649.39.1.164

Rutter, M. (1985). Resilience in the face of adversity: Protective factors and resistance to psychiatric disorder. *British Journal of Psychiatry*, *147(6)*, 598–611. https://doi.org/10.1192/bjp.147.6.598

Rutter, M. (2012). Resilience as a dynamic concept. *Development and Psychopathology 24(2),* 335-344. https://doi.org/10.1017/S0954579412000028

Rutter, M. (2013). Annual research review: Resilience - Clinical implications. *Journal of Child Psychology and Psychiatry and Allied Disciplines*, *54*(4), 474–487. https://doi.org/10.1111/j.1469-7610.2012.02615.x

Rutter, M., Moffitt, T. E., & Caspi, A. (2006). Gene-environment interplay and psychopathology: Multiple varieties but real effects. *Journal of Child Psychology and Psychiatry and Allied Disciplines*. https://doi.org/10.1111/j.1469-7610.2005.01557.x

Sabol, T. J., & Pianta, R. C. (2012). Recent trends in research on teacher-child relationships. *Attachment and Human Development*, *14*(3), 213–231. https://doi.org/10.1080/14616734.2012.672262

Salzer Burks, V., Laird, R. D., Dodge, K. A., Pettit, G. S., & Bates, J. E. (2001). Knowledge structures, social information processing, and children's aggressive behavior. *Social Development*, *8*(2), 220–236. https://doi.org/10.1111/1467-9507.00092

Scarr, S., & McCartney, K. (1983). How people make their own environments: A theory of genotype and environment effects. *Child Development*, *54*(2), 424.

https://doi.org/10.2307/1129703

Schrock, K. (2010). To spank or not to spank. *Scientific American Mind*, *20*(10).

Sheehan, M. J., & Watson, M. W. (2008). Reciprocal influences between maternal discipline techniques and aggression in children and adolescents. *Aggressive Behavior*, *34*(3), 245–255. https://doi.org/10.1002/ab.20241

Shelton, K. K., Frick, P. J., & Wootton, J. (1996). Assessment of parenting practices in families of elementary school-age children. *Journal of Clinical Child Psychology*, *25*(3), 317–329. https://doi.org/10.1207/s15374424jccp2503_8

Sheppes, G., Scheibe, S., Suri, G., Radu, P., Blechert, J., & Gross, J. J. (2014). Emotion regulation choice: A conceptual framework and supporting evidence. *Journal of Experimental Psychology: General*, *143*(1), 163–181. https://doi.org/10.1037/a0030831

Silver, R. B., Measelle, J. R., Armstrong, J. M., & Essex, M. J. (2005). Trajectories of classroom externalizing behavior: Contributions of child characteristics, family characteristics, and the teacher–child relationship during the school transition. *Journal of School Psychology*, *43*, 39–60. https://doi.org/10.1016/j.jsp.2004.11.003

Simons, D. A., & Wurtele, S. K. (2010). Relationships between parents' use of corporal punishment and their children's endorsement of spanking and hitting other children. *Child Abuse and Neglect*, *34*(9), 639–646. https://doi.org/10.1016/j.chiabu.2010.01.012

Skinner, E., Johnson, S., & Snyder, T. (2005). Six dimensions of parenting: A motivational model. *Parenting*, *5*(2), 175–235. https://doi.org/10.1207/s15327922par0502_3

Stormshak, E. A., Bierman, K. L., McMahon, R. J., & Lengua, L. J. (2000). Parenting practices and child disruptive behavior problems in early elementary school. *Journal of Clinical Child Psychology*, *29*(1), 17–29. https://doi.org/10.1207/S15374424jccp2901_3

Stouthamer-Loeber, M., Loeber, R., Farrington, D. P., Zhang, Q., Kammen, W., & Maguin, E. (1993). The double edge of protective and risk factors for delinquency: Interrelations and developmental patterns. *Development and Psychopathology*, *5*, 683–701.

Straus, M. A. (2010). Prevalence, societal causes, and trends in corporal punishment by parents in world perspective. *Law and Contemporary Problems, 73(2)*, 1-30.

Straus, M. A., & Donnely, D. A. (1994). *Beating The Devil Out of Them: Corporal Punishment in American Families* (2nd ed.). New Brunswick: Transaction Publishers.

Straus, M. A., & Stewart, J. H. (1999). Corporal punishment by American parents: National data on prevalence, chronicity, severity, and duration, in relation to child and family characteristics. *Clinical Child and Family Psychology Review*, *2*(2), 55–70. https://doi.org/10.1023/A:1021891529770

Straus, M. A., Sugarman, D. B., & Giles-Sims, J. (1997). Spanking by parents and subsequent antisocial behavior of children. *Archives of Pediatrics & Adolescent Medicine*, *151*(8), 761–767. https://doi.org/10.1001/archpedi.1997.02170450011002

Stuhlman, M. W., & Pianta, R. C. (2001). Teachers' narratives about their relationships with children: associations with behavior in classrooms. *School Psychology Review*, *31*(2), 148–163.

Taillieu, T. L., & Brownridge, D. A. (2013). Aggressive parental discipline experienced in childhood and internalizing problems in early adulthood. *Journal of Family Violence*, *28*(5), 445–458. https://doi.org/10.1007/s10896-013-9513-1

Tangney, J. P., Baumeister, R. F., & Boone, A. L. (2004). High self-control predicts good adjustment, less pathology, better grades, and interpersonal success. *Journal of Personality*, *72*(2), 271–324. https://doi.org/http://dx.doi.org/10.1111/j.0022-3506.2004.00263.x.

Taylor, C. A., Al-Hiyari, R., Lee, S. J., Priebe, A., Guerrero, L. W., & Bales, A. (2016). Beliefs and ideologies linked with approval of corporal punishment: A content analysis of online comments. *Health Education Research*, *31*(4), 563–575. https://doi.org/10.1093/her/cyw029

Taylor, C. A., Hamvas, L., Rice, J., Newman, D. L., & DeJong, W. (2011). Perceived social norms, expectations, and attitudes toward corporal punishment among an urban community sample of parents. *Journal of Urban Health*, *88*(2), 254–269. https://doi.org/10.1007/s11524-011-9548-7

Taylor, C. A., Lee, S. J., Guterman, N. B., & Rice, J. C. (2010). Use of spanking for 3-year-old children and associated intimate partner aggression or violence. *Pediatrics*, *126*(3), 415–424. https://doi.org/10.1542/peds.2010-0314

Terzian, M. A., Li, J., Fraser, M. W., Day, S. H., & Rose, R. A. (2015). Social Information-Processing skills and aggression: A Quasi-Experimental Trial of the Making Choices and Making Choices Plus Programs. *Research on Social Work Practice*, *25*(3), 358–369. https://doi.org/10.1177/1049731514534898

Thornberry, T. P., & Krohn, M. D. (2005). Applying interactional theory to the explanation of continuity and change in antisocial behavior. *Integrated Developmental & Life-Course Theories of Offending, 14,* 183–209.

Tiet, Q. Q., Huizinga, D., & Byrnes, H. F. (2010). Predictors of resilience among inner city youths. *Journal of Child and Family Studies*, *19*(3), 360–378. https://doi.org/10.1007/s10826-009-9307-5

Topçuoğlu, T., Eisner, M., & Ribeaud, D. (2013). Sex differences in the effects of parents' use of corporal punishment on children's aggressive behavior. *In Press*.

Tremblay, R. E. (2004). Physical aggression during early childhood: Trajectories and predictors. *Pediatrics*, *114*(1), e43–e50. https://doi.org/10.1542/peds.114.1.e43

Tremblay, R. E., Loeber, R., Gagnon, C., Charlebois, P., Larivée, S., & LeBlanc, M. (1991). Disruptive boys with stable and unstable high fighting behavior patterns during junior elementary school. *Journal of Abnormal Child Psychology*, *19*(3), 285–300. https://doi.org/10.1007/BF00911232

Ttofi, M. M., Bowes, L., Farrington, D. P., & Lösel, F. (2014). Protective factors interrupting the continuity from school bullying to later internalizing and externalizing problems: A systematic review of prospective longitudinal studies. *Journal of School Violence*, *13*(1), 5–38. https://doi.org/10.1080/15388220.2013.857345

Ttofi, M. M., Farrington, D. P., & Lösel, F. (2012). School bullying as a predictor of violence later in life: A systematic review and meta-analysis of prospective longitudinal studies. *Aggression and Violent Behavior, 17(5),* 405-418. https://doi.org/10.1016/j.avb.2012.05.002

Ttofi, M. M., Farrington, D. P., & Lösel, F. (2014). Interrupting the continuity from school bullying to later internalizing and externalizing problems: Findings from cross-national comparative studies. *Journal of School Violence*, *13*(1), 1–4. https://doi.org/10.1080/15388220.2013.857346

Ttofi, M. M., Farrington, D. P., Piquero, A. R., & DeLisi, M. (2016). Protective factors against

offending and violence: Results from prospective longitudinal studies. *Journal of Criminal Justice*, *45*, 1–3. https://doi.org/10.1016/j.jcrimjus.2016.02.001

Ttofi, M. M., Farrington, D. P., Piquero, A. R., Lösel, F., DeLisi, M., & Murray, J. (2016). Intelligence as a protective factor against offending: A meta-analytic review of prospective longitudinal studies. *Journal of Criminal Justice*, *45*, 4–18. https://doi.org/10.1016/j.jcrimjus.2016.02.003

Vassallo, S., Edwards, B., & Forrest, W. (2016). Childhood behavior problems and fighting in early adulthood: What factors are protective? *Journal of Criminal Justice*, *45*, 85–93. https://doi.org/10.1016/j.jcrimjus.2016.02.010

Vaughn, B. E., Kopp, C. B., & Krakow, J. B. (1984). The emergence and consolidation of self control from 18 to 30 months of age normative trends and individual differences. *Child Development*, *55*(3), 989–1004.

Verschueren, K., & Koomen, H. M. Y. (2012). Teacher-child relationships from an attachment perspective. *Attachment and Human Development*, *14*(3), 205–211. https://doi.org/10.1080/14616734.2012.672260

Vuchinich, S., Bank, L., & Patterson, G. R. (1992). Parenting, peers, and the stability of antisocial behavior in preadolescent boys. *Developmental Psychology*, *28*(3), 510–521. https://doi.org/10.1037/0012-1649.28.3.510

Wang, M., & Xing, X. (2014). Intergenerational transmission of parental corporal punishment in China: The moderating role of spouse's corporal punishment. *Journal of Family Violence, 29(2),* 119-128. https://doi.org/10.1007/s10896-013-9574-1

Wang, M. Te, & Kenny, S. (2014). Parental physical punishment and adolescent adjustment: Bidirectionality and the moderation effects of child ethnicity and parental warmth. *Journal of Abnormal Child Psychology, 42(5),* 717-730. https://doi.org/10.1007/s10802-013-9827-8

Weiss, B., Dodge, K., Bates, J., & Pettit, G. (1992). Some consequences of early harsh discipline: Child aggression and maladaptive social information processing style. *Child Development*, *63*(6), 1321–1335.

Werner, E. E., & Smith, R. (1992). *Overcoming the odds: High risk children from birth to adulthood.* Cornell University Press.

Widaman, K. F., Helm, J. L., Castro-Schilo, L., Pluess, M., Stallings, M. C., & Belsky, J. (2012). Distinguishing ordinal and disordinal interactions. *Psychological Methods*, *17*(4), 615–622. https://doi.org/10.1037/a0030003

Wildeboer, A., Thijssen, S., van IJzendoorn, M. H., van der Ende, J., Jaddoe, V. W., Verhulst, F. C., ... & Bakermans-Kranenburg, M. J. (2015). Early childhood aggression trajectories: Associations with teacher-reported problem behaviour. *International Journal of Behavioral Development*, *39*(3), 221-234. https://doi.org/10.1177/0165025414562239

Wyman, P. A., Gaudieri, P. A., Schmeelk-Cone, K., Cross, W., Brown, C. H., Sworts, L., … Nathan, J. (2009). Emotional triggers and psychopathology associated with suicidal ideation in urban children with elevated aggressive-disruptive behavior. *Journal of Abnormal Child Psychology*, *37*(7), 917–928. https://doi.org/10.1007/s10802-009-9330-4

Zelli, A., Dodge, K. A., Lochman, J. E., & Laird, R. D. (1999). The distinction between beliefs legitimizing aggression and deviant processing of social cues. *Journal of Personality and Social Psychology*, *77*(1), 150–166. https://doi.org/10.1037/0022-3514.77.1.150

Zillman, D., & Bryant, J. (1974). Effect of residual excitation on the emotional response to

provocation and retaliatory behavior. *Journal of Personality and Social Psychology*, *30*(6), 782–791.